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A STUDY OF CERTAIN PHONIATRIC RESONANCE PHENOMENA

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The doubts which were once cast on the validity of the careful stroboscopic laryngeal studies of Tarneaud and Husson by one or two users of the neon flash method of vocal cord observation have now been removed by the indisputable testimony of superspeed motion pictures of the vocal cord action during phonation. These pictures show a complete coming together of the vocal cords, followed, a variable fraction of a second later, by a more or less explosive pushing apart of the cords by each periodically released glottal puff of air. In 1936 I submitted a Ph. D. study at Ohio State University which goes on from this point which we may now consider well established. It considers the mechanics of puff tone production, the characteristics of sounds so produced, and the part played by other anatomical structures in modifying this original tone.

Puff tones can be quite loud without any resonant amplification whatever (see pp. 60–71).[1] The assumption long held that the laryngeal tone is feeble, requiring extensive amplification by head and chest cavities must be discarded. It is time. Many ill-founded theories of vocal training can be traced to this mistaken analogy with stringed instruments. Most theory involved in our therapeutic programs has been based in part on weak analogy or pure imagination. Much honest revision is needed as facts are discovered to replace the older fictions.

[1]These page numbers refer throughout this article to my Ph. D. dissertation in the Library at Ohio State University, Columbus, Ohio. Micro film copies are released by the American Documentation Institution (Science Service,) 2101 Constitution Ave., Washington, D. C., 225 pp., over 200 oscillograms. Title: A Study of Certain Phoniatric Resonance Phenomena. Only a small part of the contents has been reported elsewhere: Tongue Movements and Vowel Quality, Speech Monographs, 4, 38–43, Dec., 1937; Etude quantitative de la resonance thoracique, Rev. franc. de phon., 6, 165–167, July, 1938.

The loudest voiced sounds are produced with the most explosive type of puff tone production. This requires a maximum degree of vocal cord tension and sufficient breath pressure to force them apart periodically. The explosive puffs thus emitted in a series produce voice. Loud phonation may take no more than a 30 per cent increase in breath consumption and yet because of the greater explosiveness of the puffs yield tones with a hundred-fold increase in energy content (pp. 62–66).

The relation of vibration frequency to vocal cord tension and breath pressure explains the well known fact that in shouting we invariably raise the voice pitch as well as the loudness. To make a tone loud we throw extra tension into the vocal cord muscles and into the muscles of expiration. The greater vocal cord tension makes a greater air pressure necessary to force them apart. When they are forced apart, the puff escapes explosively, initiating a large amplitude sound wave above the glottis (and below it. See pp. 89–95). But, once the puff is released the same high degree of tension in the vocal cords is now able to bring the cords together quickly. The puff release removes the pressure below the cords. With the glottis closed again there is another quick building up of pressure followed by another explosive release, etc., the puffs following each other more rapidly as the two tensions (of the cords and of the expiratory muscles) rise together. The compensating adjustments whereby the trained singer or speaker can produce an increase in loudness without varying the pitch have not been carefully studied as yet.

Puff tones can be as rich in overtones as vibrating strings and if we espouse a puff explanation of laryngeal tone production we are not called upon to explain how the extremely short vocal cord can vibrate strongly in as many as thirty or more segments. This is a necessary, though ridiculous, assumption in the vibrating string theory of their action.

Studies of sirens and other puff tone sources (pp. 69–89) show that the overtone content which determines the quality of puff tones is subject to wide variation by slight changes in the manner of the puff release. The more explosive the puff the "richer" the quality of the tone produced. This is one piece of evidence showing we have been putting too much attention on tongue position, cavity resonance, etc., as sole determiners of the various vocal qualities.

Further evidence of this fact is supplied by our "(i)-cavity palate" (pp. 37–51). With this little contrivance in the mouth one can adjust the resonator volume of the oral cavity independently of any tongue movement. We found it possible to produce any vowel sound while the oral cavity was in the conformation typical of the vowel (i) as in the word "beet." Further, we found that the high frequency overtones characteristic of the vowel (i) are neither produced nor amplified in the part of the oral cavity anterior to the tongue-palate constriction, but apparently result from a higher order resonant frequency of the single large pharyngeal cavity back of the tongue.

This last suggestion is supported by a study of the resonant characteristics of soft-walled cavities. Some outstanding differences were found between the behavior of resonators with hard metallic walls and those having soft muscular walls (pp. 105–117). A rigid-walled cavity was found to have a much more prominent peak at its fundamental resonant frequency than at any of its higher order resonant frequencies. Soft-walled cavities had much lower amplifying effects at their fundamental frequencies since they yield to these relatively low-frequency vibrations. They may be equally effective at higher order resonant frequencies. A single soft-walled resonator, therefore, can amplify harmonics of 300 c. p. s. and 1500 c. p. s., for example, with equal effectiveness.

It has been argued for some time, especially by Russell, that the accessory nasal sinuses cannot function as resonators for the human voice under normal circumstances. Our experiments with models and our surface vibration studies over these sinuses confirm this negative view of the sinus action in phonation (pp. 141–150). There seems to be absolutely no excuse for any further spreading of this particular fallacy.

Vibratory sensations which the singer or speaker can feel during different types of phonation have given rise to some of the common misconceptions of resonance. Consider "chest resonance" for example. As might be expected, measurements show a greater degree of chest wall vibration for low pitched sounds than for high. It is easier to shake a heavy mass back and forth slowly than to shake it rapidly. These vibrations give rise to sensory impulses from the chest region which are naturally most evident for the low pitches or "chest register" of the voice.

These chest wall vibrations represent an energy loss, however, rather than any amplifying or sounding board action as has been often suggested (pp. 117–133). Various oscillograms show that the greater the degree of constriction in the vocal channel leading from the larynx to the outer air, the greater the wall vibrations of that channel and of the trachea. The most intense sensations of chest or head vibration are experienced when the proportion of laryngeal sound reaching the outer air is a minimum, i. e., when there is the greatest waste in the form of mechanical wall vibrations.

Naturally, there is some sound transmitted from the chest walls as there would be from any vibrating surface. We measured the intensity of this sound alone by leading away that passed through the mouth and nose through a long pipe, thus leaving the microphone to pick up only such sound as might be radiated through chest and other walls. The intensity of the sound transmitted from the neck and chest walls was thereby found to be from thirty to forty decibels below the intensity of the sound coming from the mouth, and hence these surfaces are proved to absorb rather than amplify the vocal tone.

The efficiency of acoustical coupling at the mouth opening is of far greater practical significance than any slight head or chest res-

onance. The coupling efficiency is determined by the proportion of sound energy in the larynx which reaches the outer air. As pointed out above, constrictions within the vocal channel can reduce this efficiency. The coupling efficiency is also a function of the size of the mouth opening. A series of oscillograms (p. 154) shows the effect of this often overlooked factor on the amplitude of the sound wave in the air. Close-mouthed speech is one of the commonest thieves of vocal efficiency on this account.

Of course, nature puts an upper limit on the degree of mouth opening which can be used conveniently. Yet, if our mouths were larger we would have much stronger voices with no greater expenditure of energy. This is the secret of the megaphone's amplifying effect. A series of oscillograms (p. 159) illustrates several interesting facts in this connection. Although the intensity of a voiced sound when using a megaphone is greatly increased over that obtained without its use (as measured across a room), the amplitude of the sound wave at the mouth of the megaphone may be even less than that of the unassisted voice when it is measured at equally close range. In spite of the much larger amount of sound energy transmitted to the atmosphere with the megaphone there is no increase in the amount of energy required of the speaker. The vocal cord vibration is no more intense, there is no more breath consumed, there is no heightened feeling of fatigue (pp. 157–161). The megaphone owes its amplifying effect (and "carrying power") not so much to any directive or resonant effect as to its more effective coupling of the larynx with the external air.

The last subject treated is another notorious thief of vocal energy: nasality (pp. 169–208). One need not search far to find references to nasal resonance as an aid to good quality voice production. It is sometimes suggested that the velum be lowered slightly in order to add this nasal resonance. Our studies show conclusively that any amount of opening between oral and nasal cavities results in a decreased loudness of the voiced sound. Certainly, too, there is a very definite "talking through the nose" quality if the velum does not completely close the nasal passageway. Whether this quality is desirable or not is, of course, a matter of taste. Certainly it has never received the sanction of good usage in English speech. The low vocal efficiency of this type of nasality may be further decreased by close-mouthed speech since these two characteristics are often found together.

In our study we found it necessary to divide rhinolalia aperta into two sub-classes according to the opposite physiological and acoustical characteristics of the members. First, we distinguish a relaxed velum type of nasality (r. v. n.), characterized physiologically by too little muscular contraction. Hence, this type is often found with generally slovenly speech. Acoustically, r. v. n. qualities are found to be deficient in high harmonics, giving the voice a somewhat muffled quality. The voice is usually weak.

The second type we describe as "whang" nasality. Physiologically it is characterized by too *much* muscular contraction, showing especially in the pharyngeal and other supra-glottal muscles. The velum tends to be pulled down rather than allowed merely to hang relaxed. Acoustically, we find the high harmonics exaggerated at the expense of the lows. This is evident from oscillograms of these sounds (pp. 172–174). A 2800 c. p. s. "puff oscillation" is especially evident in these whang nasal sounds. This puff oscillation has been found important in imparting "richness" to good quality voices. Its purer form, however, when unsupported by lower frequency harmonics (as exemplified in the whang nasal quality) is generally considered unpleasant, though lovers of "Hill-Billy" and certain types of primitive music think otherwise. It is acoustically far more efficient than the r. v. n. type. Whang nasal voices "carry" well since the ear is most sensitive in the "whang" or puff oscillation frequency region.

It has been suggested that even though the velum is raised during normal phonation the air in the nasal cavities may yet be set into vibration through the velum itself. Thus, it is said, a nasal co-vibration may contribute in an important way to the general voice quality and loudness. A series of rather painstaking experiments disproves this idea (pp. 177–205).

The intensity of the sound emitted from the nostrils and the intensity of that emitted from the mouth was measured over a pitch range of two and one-half octaves, for six different vowels, spoken with a normal (raised-velum) quality, a relaxed velum nasal quality, and a whang nasal quality. In raised velum phonation the intensity of the sound from the nostrils was found to be about thirty decibels below that from the mouth. Hence, in normal (raised-velum) phonation so-called nasal resonance plays no perceptible part.

Breathiness also reduces vocal efficiency. This quality of voice lacks high harmonics (except for the sound of the breath itself) and hence has a "muffled" quality somewhat like that of relaxed velum nasality. In fact, these two abnormalities are often mixed. The lack of high harmonics comes from the weak closure of the glottis between puffs. This prevents the formation of explosive puffs with their resultant puff oscillation brillance. In extreme breathy qualities there may be no complete closure of the glottis at all.

REPORT OF THE 1940 ANNUAL BUSINESS MEETING

The Annual Convention of the A. S. C. A. was held at State College, Pa., in conjunction with that of the American Association for Applied Psychologists, on September 2–4, 1940.

The following officers were elected for a two year term, beginning January 1, 1940: President, Samuel D. Robbins, Emerson College; First Vice-President, Herbert Koepp-Baker, Pennsylvania State College; Second Vice-President and Chairman of Program Committee, Harry J. Heltman, Syracuse University; Secretary, D. W. Morris, Indiana State Teachers College; Treasurer, Bryng Bryngelson, University of Minnesota. Wendell A. L. Johnson, University of Iowa, was elected Councillor for a term of four years. G. Oscar Russell, Ohio State University, was continued as Editor for an indefinite term.

The Committee on Education was instructed to bring in specific recommendations at the next annual meeting concerning the qualifications for the different classes of membership in the Association. The incoming president appointed Dr. Elizabeth A. McDowell, Dr. Martin F. Palmer and Dr. Meyer Solomon, members of this Committee in place of those whose terms expire this year, and named Dr. Mack D. Steer chairman. $150 was appropriated for the use of this Committee.

It was voted to meet next year with the N. A. T. S. in Detroit.

$500 was reappropriated for the publication of a revised and enlarged "Dictionary of Terms Dealing with Disorders of Speech and Voice" and the Nomenclature Committee was continued to complete this.

Resolutions were passed expressing thanks to the Program Committee, the Pennsylvania State College, and the American Association for Applied Psychologists for their help in making this one of our most successful conventions.

At the last meeting of the American Speech Correction Association the following resolution was unanimously adopted:

"Whereas, The American Speech Correction Association is the official organization of trained specialists in the field of remediation of speech handicaps, and

"Whereas, it has been established that a large percentage of the population is so handicapped as was shown in the past war, and

(Continued on page 332)

THE HEREDITARY FACTOR IN SPEECH

E. Mary Huyck,
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Uncritical speculations, casual analyses of dubious value, and very few technical, research papers, all scattered throughout the general literature of biology constitute what little is known about the relationship between heredity and the mechanisms and special aptitudes involved in speech. As an objective, this paper seeks to focus the attention of students upon the general "hodge podge" condition in the hope that some will seriously undertake the search for a solution to this important and neglected aspect of the speech problem. This in mind, the author will consider three genetic problems: first, the mechanics of heredity as related to tectological factors concerned in speech; second, the hereditary basis for certain abnormal conditions; and third, an inquiry into the nature of man's so-called inherited capacity (or aptitude) for speech.

I. The Mechanics of Heredity and Speech

The potentialities of inheritance are transmitted through that fundamental biological unit, the germ cell and its components. In its nucleus are chromosomes and in each of these chromosomes in a precise arrangement are character determiners or genes. These determiners or genes are the bearers of heredity; either singly or in various combinations with the genes of other chromosomes; and since the day of Gregor Mendel, their effects in many instances as reflected in the appearance of inherited traits appear in the progeny in a predictable and more or less mathematical manner.

A brief theoretical exploitation of the possible genetic variations within the range of normal speech will indicate in part the complexity of the problem and the need for data. Consider the mating of two individuals alike in all respects except two physical structures related to speech such as variations in the structures of palate and tongue. Postulate ten variations which would not deprive the offspring of normal speech.

For example:

Individual A . .	mated with . .	*Individual B*
Soft Palate:		Soft Palate:
1. Short uvula.		1. Long uvula.
2. Round tip of uvula.		2. Pointed tip of uvula.
3. Wide velum.		3. Narrow velum.
4. Thin velum.		4. Thick velum.
5. High palatal arch.		5. Low palatal arch.

Tongue:	Tongue:
1. Broad tip.	1. Pointed tip.
2. Short.	2. Long.
3. Long frenum.	3. Short frenum.
4. Narrow base.	4. Wide base.
5. Thin.	5. Thick.

Such a mating with respect to these two anatomical organs alone, would involve the possible production of (2^{10}) or 1024 genetically different kinds of gametes and could result in 1,048,576 possible gene combinations. This gives an enormous range of variability to normal speech. The Mendelian expectation from such crosses is summarized in the table below.

Number of Factor Pairs in which Parents Differ	Number of Different Phenotypes	Number of Different Genotypes	Number of Individuals Necessary to Obtain All of the Different Types
1	2	3	4
2	4	9	16
3	8	27	64
5	32	243	1024
7	128	2187	16384
9	512	19683	262144
10	1024	59049	1048576
n	2^n	3^n	4^n

This simplified scheme is undoubtedly complicated by blending inheritances, sex linkages, multiple alleles, etc., that modify Mendelian ratios. Some of these factors the reader will notice as he studies the table summarizing the hereditary factors in abnormal speech under the second consideration. No attempt has been made to explain the transmission of characters involved in normal speech, and the methods suggested under the consideration of abnormals is based either on studies made upon rats or, at best, upon an inadequate number of cases. The importance of such information is obvious. If all of the pertinent data were available, the limitations for the training of either normals or abnormals in speech could be readily anticipated. A corresponding loss of time and the expenditure of needless effort could then be eliminated.

II. The Hereditary Bases for Abnormal Speech

The second major consideration is the hereditary bases for certain abnormal conditions of speech. West (37),[1] Travis (34), Seth and Guthrie (25), follow the traditional attitude of the correctionist set forth in the following quotation from Twitmeyer and Nathanson:

> "There yet remains . . . an 'x' factor which functions in a manner inexplicable to science. . . . The least offensive postulate we can advance to account for the observable physical or mental deviations must find expression in terms of *inherited*

[1]Numbers in parentheses designate the corresponding listings in the References at the conclusion of this article.

diathesis, and if we include congenital or immediate postnatal conditions, it were more accurately put as residual diathesis." (35)

Such a postulate finds scientific evidence for its acceptance in Jennings' (14) illustration of the fruit fly explaining the effects of genes and environments. Fruit flies, (Drosophila) grown in the usual bottles containing decaying bananas and moist atmosphere, have ill-formed abdomens. The defect is due to a gene located in the X-chromosome and is dominant in its behavior. But the appearance of the defect is conditioned by the environment. It will appear only if the fruit fly is grown in moist atmosphere. Similarly, by analogy, the speech correctionist seems to reason thus—a gene for a particular defect may be present in the individual but unexpressed unless environmental conditions are favorable. Again all this reasoning has been accepted by analogy as far as the scientist in speech is concerned.

Stuttering is the most talked-of case in point. All studies have considered the defect as a complex rather than segregating responsible units. Travis (34) is among those Americans accepting this reasoning of the German school. Denhardt (25) has found evidence indicating hereditary transmission in 79 per cent of the cases of stuttering, and Gutzmann found the defect in 26.8 per cent of the other members of the stutterer's family. A more recent study by Bryngelson and Rutherford (5) indicates that 18 per cent of the non-stutterers and 46 per cent of the stutterers have a genetic background of stuttering. Possibilities of imitation leave the results of these studies open to question. Imposing research was reported recently by Dr. West (38). After a study of 204 stutterers matched with non-stutterers—both having complete case histories—he shows rather conclusive evidence that stuttering has a sexual hereditary nature. The sex ratios among the relatives of stutterers reduce the possibility of error due to imitation. Although Wepman (36) published a study after that of West, he apparently had not considered the former's results in interpreting his cases. Had he done so he might have been less hesitant in venturing the conclusion that stammerers do tend to appear more frequently in the families of stammerers than in the families where there has never been stammering and that stammering appears more frequently in men than in women. It is to be regretted that as yet neither West nor Wepman can show evidence revealing the method of genetic transmission. For example, if the severity of the disorder should depend upon a multiple-allele manner of transmission, the correctionist might be able to forecast the limitations of his corrective procedures and thus avoid wasted effort. In the discussion of this defect the heredity of handedness may be mentioned because of its association with problems of cerebral dominance and speech. The same Bryngelson and Rutherford (5) study just mentioned reveals that 74 per cent of the stutterers and 63 per cent of the non-stutterers have a heredity of left-handedness. Left-handedness—probably transmitted as a Mendelian recessive—appears, however, dominant in some families (15). Studies on twins (21)—identical and fraternal—have attempted to explain the

increased frequency of left-handedness in both types largely in relation to monozygotic and dizygotic developments. The latter interprets handedness of twins on a different basis than the trait in the general population. If the student accepts the common postulate that associates handedness with speech through cerebral dominance, he will find its hereditary nature to be a further reason for adjusting therapeutic treatment to genetic traits.

A second approach to the heredity of abnormal speech conditions is through inheritance of defective mental or physical traits which usually have speech involvements. Scattered and infrequent and fragmentary studies are available to the diligent searcher. A summary is found in the table below:

Trait	*Method of Transmission*	*Probable Speech Involvement*
Toothlessness (33)	Recessive, sex-linked in certain strains	Dyslalios
Abnormal dentition (2)	Mendelian dominant	Dyslalios
Absence of upper lateral incisors (16)	Arises by mutation. Mendelian, irregularly dominant	Dyslalios
Harelip (22, 3, 6, 10, 27)	Cumulative genes or one gene which allows expression only when homozygous the extent of which is controlled by many genetic and environmental factors	Dyslalios
Huntington's chorea (8)	Simple Mendelian	Dysarthrias
Hollow Chest (30)	Dominant autosomal gene	Dysphonias
Diseases of Accessory Nasal Cavities (11)	Not determined	Dysphonias
Mongolism (26)	Two dominant genes	Dysarthrias
Defect of the inner ear concerning deafness (4)	Dominant, recessive, lethal	Dysphonias Dyslalios
Autosclerosis	Dominant and irregularly dominant, recessive. Two genes may be responsible	Dysphonias
Hereditary Deaf Mutism (4)	Recessive Mendelian	Dysphonias
Epilepsy	Undetermined	Dysarthrias Dysphemias
Feeblemindedness	Multiple alleles; recessive	Dysarthrias Dysphemias

Robb (23) investigating the relative frequency of inheritable disorders of children in a Rochester, New York, hospital, concluded that "disorders of genetic origin are as numerous as any other single disease recorded in hospitalized children." Among eight hundred cases of presumably genetic origin, the following would be likely to have special speech implications:

Mental Retardation	115 cases
Epilepsy (idiopathic)	63 cases
Asthma and Hay Fever	140 cases
Marked Mental Deficiency	39 cases
Hypothyroidism	21 cases
Extreme Obesity	20 cases
Cleft Palate	10 cases

Investigators might well devote more study to this part of the heredity of speech disorders.

A third approach related to abnormals was evidenced in Rutherford's study of "Speech Re-education for the Birth Injured" (24) recently published. In her analysis of seventy-three cases of this type, one of the seven factors studied was heredity. Four items were considered: (1) dysphemia, (2) ambidexterity or left-handedness, (3) strabismus or twinning, (4) reading, writing or other speech disabilities. Why this grouping of atypical items was used, how the investigator established the fact that the items existed in the heredity of the individual, why such "hereditary" items should be considered in connection with spastic speech, or even how such a general classification as "reading, writing, or other speech disabilities" can be considered as hereditary is not explained by the author. Below is her summary of the work on heredity.

"a. 5% of the 16 cases in the dysphemia group have dysphemia in heredity.

18% of the 34 cases in the dysarthria group have dysphemia in the heredity.

42% of the 19 cases in the good-speech group have dysphemia in the heredity.

b. 63% of the dysphemia group have ambidexterity or left-handedness in the heredity.

70% of the dysarthria group have ambidexterity or left-handedness in the heredity.

74% of the good-speech group have ambidexterity or left-handedness in the heredity.

c. 38% of the dysphemia group have strabismus or twinning in the heredity.

26% of the dysarthria group have strabismus or twinning in the heredity.

16% of the good-speech group have strabismus or twinning in the heredity.

d. 25% of the dysphemia group have reading, writing or other speech disabilities.

18% of the dysarthria group have reading, writing or other speech disabilities.

16% of the good-speech group have reading, writing or other speech disabilities."

Miss Rutherford does admit that heredity may not be an important factor if the presence of a lesion is the important element. Such reports can only add confusion and misunderstanding to the limited knowledge already accumulated in speech pathology. The student of speech who discusses genetic problems should use a genetic approach.

III. The So-Called Innate Capacity to Speak

The third consideration of this paper is to suggest how this mechanism may function in the transmission of the so-called "innate capacity to speak." Although the mechanism just described is biological, authorities seem to concede that it may be used to transmit aptitudes which are considered non-biological traits. If the aptitude for speech can be considered as a special ability, the student may find positive evidence in the families of great actors such as the Barrymores or Skinners which might parallel the Bach (29) family tree. In this last pedigree six generations produced fifty-seven musicians of repute, twenty-nine of whom were noted. Indirect evidence also might be gleaned from Winship-Davenport's study of the Elizabeth Tuthill tree, a family the members of which were engaged in a large number of occupations dependent to a large extent upon skilled speech relations.

> "But the union of two streams of great blood of similar character begets great blood. The son of the first marriage was Timothy Edwards, one of the founders of Yale University. He was father of Jonathan Edwards. From Jonathan Edwards, who married a wonderful woman, Sarah Pierpont, have descended 12 college presidents, 265 college graduates, 65 college professors, 60 physicians, 100 clergymen, 75 army officers, 60 prominent authors, 100 lawyers, 30 judges, 80 public officers—state governors, city mayors, and state officials—3 congressmen, 2 United States senators, and 1 vice-president of the United States."(39)

Psychologists as yet have furnished no measure of innate ability. By inference only have they claimed to do so for certain traits. In generalizing on the matter of special abilities Arlitt and Holmes conclude:

> "Special abilities also appear to be transmitted, but here again, the degree to which these will appear cannot be predicted from the degree to which they have appeared in the parent stock." (1)
>
> "There is evidence that special abilities as well as general intelligence runs in families, but the proper evaluation of the hereditary factors involved is complicated by the coincident influence of environment and tradition." (13)

No one has attempted to study long family histories solely from the point of view of speech ability. The approach seems to be discordant with the modern concept. Generally speech is interpreted as a means of communication which depends upon the co-ordination of many abilities. It is possible that each isolated factor must receive separate consideration of the type that Mendel gave to his traits rather than treatment as a complex before the hereditary aspect is appreciated. Certain authorities in speech—among them Eisenson (9), Seth and Guthrie (25)—stress the close relation between

intelligence and speech ability. Murray (20) reflects the modern psychological approach in his book which presents speech in terms of the many aspects of the speech personality. A brief review of what the geneticists contribute to each of these lines of thought is enlightening to our problem.

To establish the relationship between intelligence and speech Eisenson's conclusions are quoted. They reflect the studies of Hildreth (12), C. D. Mead (19), and D. McCarthy (18), and are in harmony with the ideas of the British Seth and Guthrie (25).

> "Although the exact relationship between language development and intelligence is obscured by the large and important part language tests play in intelligence, there is little doubt that the more intelligent children have richer vocabularies and in general better control of language than normal and dull children." (9)

Holmes (13) writes that most critical students of genetics are inclined to adopt a multiple-factor hypothesis for mental deficiencies. These factors behave as dominants or partly dominants and vary in their effects. Therefore, society has the great group of borderline cases who find their way into the public schools and whose genetic limitations ought to be recognized by teachers of speech. Concerning certain types below the borderline-group, West (37) especially emphasized the necessity of building speech rehabilitation programs within the genetic limitations of the subject's intelligence. Such advice as this is given:

> "Rehabilitation of speech of the uncured Mongol, therefore, should be undertaken only with the clear understanding of everyone concerned that the therapy is experimental, and that any possible results will be meager and in proportion to the patient's level of intelligence." (37)

Karl Pearson's studies at Oxford University and others show a fairly high correlation between parents and offspring (about .3) based upon parent and son records. It is an indication that the genetic factor figures also in the highly intelligent groups. However, this evidence does not minimize the importance of environment. In its extremes, environment may markedly alter the expression of genetic factors. For example, thyroxin in early development results in feeble-mindedness which may be alleviated by the administration of thyroid extract and a person so treated may respond by the return to normalcy with respect to their mental faculties and physical traits. For students of speech a reasonable and adequate summary of the present status of the intelligence factor has been made by Holmes.

> "If we would sum up what appear to be reasonable conclusions in regard to the role of nature and nurture in mental development, the following would seem to be justifiable statements:

> Both heredity and environment may cause very great differences in the mental development of human beings.
>
> Hereditary factors can make the difference between a low grade idiot or imbecile and the native endowments of the highest type of genius.
>
> Environment can depress or inhibit the development of the mind to any degree consistent with the maintenance of life.
>
> To a certain extent nurture can increase intelligence as this trait is measured by any kind of test yet devised. Its power of doing so varies in different individuals, being very slight in idiots and imbeciles and becoming greater as hereditary capacity is increased.
>
> The power of nurture to increase intelligence is limited. There is no known method of making superior intelligence out of poor hereditary material . . .
>
> There is still room for reasonable differences of opinion as to the role of nature and nurture in causing unequal degrees of intellectual development." (13)

Because the present student of speech has been drilled recently so thoroughly in the concepts of speech personalities and their training, some attention ought to be given to the neglected hereditary approach here. Dogs, for example, show differences in emotional reactivity according to breeds. Coburn (7) mated wild and tame mice and claimed to show the potency of heredity in transmitting these factors. Certainly heredity could be concerned only with the most elemental of personality traits if the above mentioned conclusions were applicable to man. Through these lowered thresholds toward certain types of response, Stagner (31) claims that heredity can influence personality. Positive evidence of this is noticeable in the crying habits of infants even before they are taken from the hospital. Stagner also emphasizes two other avenues of hereditary influence through physical traits and intelligence. Certain students, Stockard (32) in particular, consider hormones the important directors of personality. Their action, though environmentally controlled, may be genetically determined (13). Possibly voice is another factor where nurture exerts its influence. Newman's (21) twins, even in the separated cases, were marked by close resemblance in voices. With the exception of Newman's study on twins and Coburn's on rats, these ideas should be interpreted as opinions rather than conclusions based upon evidence.

From this fragmentary study concerning the so-called "innate capacity to speak" certain generalizations might be ventured:

(1) There have been no studies of pedigrees to determine whether speech ability is inherited.

(2) Individual traits such as intelligence or physical traits are probably the important genetic contributors to the speech personality.

(3) Indirect influences through hormones or certain elemental dispositions may be inherited components of personality.

In his study of identical twins, Newman concludes:

> "The most significant fact which is brought out by these distributions of composite differences is the fact that the physical traits distinguish between the identical and fraternal twins much more sharply than do mental traits. The difference in the contrast between the two groups on physical and mental traits may be due in part to the fact that measurements of the former are more accurate than those of the latter, but it is hardly likely that this is the sole explanation. It seems probable that either the mental traits are less subject to definite determination by heredity than are the physical traits, and in contrast the mental traits are somewhat more largely influenced by environment, or the inheritance of a mental trait is subject to a different hereditary law than is the inheritance of a physical trait."

Conclusion

Conclusions from such material as the writer has discussed above are not warranted and should not satisfy the exacting mind. Research is lacking in quantity and quality. With the exception of conditions related to abnormal speech, generalizations are speculative and are not factual. Even in consideration cited in abnormal speech the paucity of instances studied permits only tentative indications of possible biological mechanisms. The above analysis is offered as a means of orientation for the more exacting student and as a plea for much needed research upon heredity and its role in speech.

REFERENCES

(1) **Arlitt, Ada Hart.** *Psychology of Infancy and Early Childhood.* McGraw-Hill Book Company, Inc., New York and London, 1930.
(2) **Beadle, O. A.** "An Inherited Anomaly of Dentition," *Journal of Genetics*, 17: 199–206, 1926–27.
(3) **Birkenfeld.** "Ueber die Erblichkeit der Lippenspalte und Gaumenspalte," *Arch. Kl. Chir.*, 141: 729, 1926.
(4) **Brown, W. H.** Lectures in Eugenics, (unpublished), University of Arizona, 1st semester, 1938–39.
(5) **Bryngelson, Bryng,** and **Ruth Rutherford.** "A Comparative Study of Laterality of Stutterers and Non-Stutterers," *Journal of Speech Disorders*, II, No. 1, 1937.
(6) **Cloudman, A. M.** "Genetic Studies in Harelip," *Proceedings of the Sixth International Congress of Genetics*, 2: 26, 1932.
(7) **Coburn, C. A.** "Heredity of Wildness and Savageness in Mice," *Behavior Monograph*, IV, 5, 1922.
(8) **Davenport, C. B.** "Sex Linkage in Man," *Genetics*, 15: 401–444, 1930.
(9) **Eisenson, Jon.** *The Psychology of Speech*, F. S. Crofts & Co., New York, 1938.
(10) **Fortuyn, A. B. D.** "Inheritance of Harelip and Cleft Palate in Man," *Genetica*, 17: 349–366, 1935.
(11) **Grunberg, Hans.** "The Inheritance of a Disease of the Accessory Nasal Cavities," *Journal of Heredity*, 29: 368–374, 1934.

(12) **Hildreth, G.** "Mental Ability Measured by Verbal and Non-Verbal Tests," *Teachers College Record*, Nov., 1932, pp. 134–142.
(13) **Holmes, S. J.** *Human Genetics and Its Social Import*, McGraw-Hill Book Company, Inc., New York and London, 1936.
(14) **Jennings, H. S.** *The Biological Basis of Human Nature*, W. W. Norton and Company, Inc., New York, 1930.
(15) **Jordan, H. E.** "The Inheritance of Left-Handedness," *American Breeders Magazine*, 11: No. 1, p. 10, 1911.
(16) **Keeler, C. E.,** and **R. Short.** "Hereditary Absences of Upper Lateral Incisors," *Journal of Heredity*, 25: 391–392, 1934.
(17) **Komaley, F.** "Inheritance of Left-Handedness," *American Naturalist*, No. 47, p. 770, 1913.
(18) **McCarthy, D.** *Language Development in the Pre-School Child*, University of Minnesota Press, 1930.
(19) **Mead, C. D.** "Age of Walking and Talking in Relation to General Intelligence," *Pedagogical Seminary*, XX: 460–484, 1913.
(20) **Murray, Elwood.** *The Speech Personality*, Lippincott's, Chicago, 1937.
(21) **Newman, Horatio, Frank N. Freeman** and **Karl J. Holzinger.** *Twins: Study of Heredity and Environment*, The University of Chicago Press, Chicago, Illinois, 1937.
(22) **Reed, S. C.** "Harelip in the Housemouse," *Genetics*, 21: 361–374, 1936.
(23) **Robb, R. Cumming.** "The Relative Frequency of Inheritable Disorders in Children," *Genetics*, 22: 205, 1937. (abstract).
(24) **Rutherford, Bernice R.** "Speech Re-education for the Birth Injured," *The Journal of Speech Disorders*, 3: 199–206, 1938.
(25) **Seth, George,** and **Douglas Guthrie.** *Speech in Childhood, Its Development and Disorders*, Oxford University Press, London: Humphrey Milford, 1935.
(26) **Penrose, L. S.** "On the Interaction of Heredity and Environment in the Study of Human Genetics (with Special Reference to Mongolian Imbecility", *Journal of Genetics*, 25: 406–422, 1932.
(27) **Sanders, J.** "Inheritance of Harelip and Cleft Palate," *Genetica*, 15: 433–510, 1934.
(28) **Schroeder, C. H.** "Die Vererbung der Hasescharte und Gaumenspalte," *Arch Rass U. Ges Biol.*, 25: 369, 1931.
(29) **Sheideman, Norma V.** *The Psychology of Exceptional Children*, Houghton Mifflin Company, Boston, 1931.
(30) **Snyder, Laurence H.,** and **George M. Curtis.** "An Inherited 'Hollow Chest'," *Journal of Heredity*, 25: 445–447, 1934.
(31) **Stagner, Ross.** *Psychology of Personality*, McGraw-Hill Book Company, Inc., New York and London, 1937.
(32) **Stockard, C. J.** *The Physical Basis of Personality*, W. Norton & Company, New York, 1931.
(33) **Thadani, K. I.** "The Toothless Man of Sind," *Journal of Heredity*, 25: 483–484, 1934.
(34) **Travis, L. E.** *Speech Pathology*, D. Appleton-Century Company, Inc., New York, 1931.
(35) **Twitmeyer, E. B.,** and **Y. S. Nathanson.** *Correction of Defective Speech*, P. Blakiston's Son & Co., Philadelphia, 1932.
(36) **Wepman, Joseph M.** "Familial Incidence in Stammering," *The Journal of Speech Disorders*, 4: 3, pp. 199–204, 1939.
(37) **West, Robert W., Lou Kennedy** and **Anna Carr.** *The Rehabilitation of Speech*, Harper & Brothers, New York, London, 1937.
(38) **West, Robert, Severina Nelson** and **Mildred Berry.** "The Heredity of Stuttering," *The Quarterly Journal of Speech*, 25: 1, pp. 23–30, 1939.
(39) **Wiggam, Albert Edward.** *The Fruit of the Family Tree*, The Robbs Merrill Company, Indianapolis, 1924.

STAMMERING AND INHIBITION

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While this article is not intended to be controversial, it is none the less a reply to Dr. Elmer L. Kenyon's Critical Examination of my theories of stammering which recently appeared in the Journal of Speech Disorders.[1] Unfortunately this criticism is based almost entirely on my book, *Stammering and Cognate Defects of Speech*, which was written twenty-eight years ago. Dr. Kenyon offers some objection to the re-statement of the theories as presented in *Mental Aspects of Stammering*, published ten years ago; but he ignores my more recent writings. My theories have been clarified in *Stammering and Allied Disorders* and in *The Troubled Mind*, both published within the last five years. I feel that these newer books rather than the older writings might more profitably have been subjected to critical examination.

My original theory of stammering, or perhaps the presentation of it, was unquestionably crude. I ascribed the stammerer's speech disturbance to transient auditory amnesia, and I attributed the futile struggle of stammering to the effort to speak solely with kinesthetic imagery. Manifestly this was an attempt to explain stammering in terms of introspective psychology, which was the dominant psychology of three decades ago. Yet this theory of auditory amnesia is not without significance, for it may have had the effect of turning attention from the physiological disturbances of speech to the psychological aspects of the disorder. In the early part of the century investigators of stammering were preoccupied with the stammerer's breathing, with his vocalization, and with the faulty manner in which he managed his lips and tongue. They were confusing themselves and they made little progress toward an understanding of the disorder. Nowadays the student of speech disorders has his mind sharply on the psychological factors, and he is better oriented in the problem. Possibly my old theory of auditory amnesia may have given some impetus to this transition.

It will be seen that my conjecture regarding transient auditory amnesia contained the nucleus of the present theory that stammering results from inhibition. In *Mental Aspects of Stammering*, published in 1930, I used the word *recoil* to express the conception of inhibition, and I characterized the subjective aspect of stammering as "a break in the continuity of consciousness." In *Stammering and Allied Disorders*, published in 1935, I have treated the subject more technically, and have given my reasons for regarding speech as a conditioned reflex and stammering as a partial inhibition of the reflex.

[1]Elmer L. Kenyon. A Critical Examination of the Foundations of the "Recoil of the Vowel" Theory of the Cause of the Impediment of the Speech in Stammering. The Journal of Speech Disorders, June, 1940.

For the validity of the theory it matters very little whether speech is regarded as a conditioned response or as an inborn or unconditioned response. Inhibition can disturb either type of reaction, hence the viewpoint concerning the genetics of speech is immaterial. The main consideration is whether or not inhibition offers a satisfactory explanation of stammering. In attempting such an explanation in *Stammering and Allied Disorders* I discussed Pavlov's experiments at considerable length and drew a parallel between inhibition of the salivary reflex and inhibition of speech. It is scarcely feasible to repeat the discussion in the present article and I will refer only to the phenomenon which Pavlov calls the "extraneous stimulus." An extraneous, or unexpected, or unusual stimulus has the effect of checking the accustomed conditioned reflex. Thus if a strange worker appeared in Pavlov's laboratory, the dog's conditioned reflexes were partially or completely abolished. In parallel situations there is inhibition of the speech reflex of the stammering child—and even at times of the non-stammering child. Pavlov recounts an incident in which his dogs were exposed to the hazard and excitement of a flood. When the dogs were returned to the laboratory a week later it was found that many of them had lost their conditioned reflexes, that is, the reflexes were inhibited. Here again the parallel applies to speech. The shock of a flood, or a fire, or an air raid may lead to mutism or stammering. Pavlov mentions another incident that is enlightening. He once presented a dog before a scientific audience, expecting to demonstrate his experiments. To his surprise the dog stood as though spellbound and then went to sleep. Dr. Stanley Cobb has pointed out to me a parallel situation with the stammerer. The stammerer who is waiting to address an audience and is nervous at the situation may actually fall asleep in his chair. I have not observed this phenomenon but I can vouch for the reaction of yawning.

All of this may be unconvincing to the reader who is unfamiliar with the clinical manifestations of inhibition. Yet the conception of stammering as a form of inhibition may be more plausible if we consider some of the situations in which inhibition manifests itself.

Fainting is a rather striking form of inhibition. The reaction occurs not only to pain but also to extraneous stimuli of an emotional character. Thus one may faint on witnessing an accident or an operation; one may faint from excitement or on hearing bad news.

A rare but illuminating form of inhibition is the reaction of cataplexy. Cataplexy is commonly associated with narcolepsy, an abnormal condition in which a person is overcome by an overpowering impulse to sleep. We will forego discussion of narcolepsy and consider merely the manifestations of cataplexy. A person affected with cataplexy reacts in a characteristic manner to an extraneous stimulus; when startled or surprised he feels weak in the knees, or drops to the floor, or loses control of the skeletal muscles. One young man who suffers from this disorder says that he is unable to laugh standing up; if he laughs on his feet he loses control of his muscles and topples over. If he tells a funny story his muscles collapse as he comes to the point. Another young man says that his knees

collapse if he meets an old friend unexpectedly. Once he was sitting in his car talking about a friend when the man suddenly appeared round the corner. Immediately he lost control of his muscles and could not lift a finger. If he had attempted to get out of the car he would have fallen in a heap. A lad of fourteen says that he gets weak in the knees whenever he laughs; at the same time the muscles of his neck get limber and his head drops forward. He regains muscular control as soon as he stops laughing—this being the common experience with cataplectics. A woman with cataplexy drops her knife and fork when anyone cracks a joke at the table. She drops her packages if a car startles her when she is crossing the street. When she saw an accident on the street her knees gave way and she fell to the ground. A person suffering from cataplexy makes a poor fisherman, for he usually collapses from excitement as soon as he hooks a fish. One young man caught eighteen trout when fishing from a raft; he fell over on the raft eighteen times.

Although cataplexy affects the skeletal muscles instead of the speech muscles, it is in many respects similar to stammering. It occurs in emotional situations and it renders the victim incapable of response. The stammerer, like the cataplectic, is often incapable of telling a story, for on reaching the point he is apt to lose control of his speech. Both the stammerer and the cataplectic appear to be victims of inhibition.[2]

Inhibition can disturb practically any function of the body. A person in a profound state of emotional depression will sometimes lose the sense of taste and smell. One in a state of acute anxiety may experience dryness of the mouth because of inhibition of the salivary secretions. Under emotional stress one may develop hysterical dysphagia,—a purely functional disturbance in swallowing. In the simplest type of this disturbance there is difficulty in swallowing a pill or disagreeable food; in the severe type of the disorder the patient may find it impossible to take any kind of solid food. The difficulty is really one of stammering, stammering in the act of swallowing. There are stammering disturbances of the urinary bladder. This inhibition is likely to occur when a person is self-conscious under observation or when he finds it necessary to void under unusual circumstances—for instance, while confined to bed. There are hysterical dysrhythmias of breathing which are forms of inhibition. Physicians also encounter hysterical blindness, in which there is partial or complete or intermittent loss of sight purely on the basis of inhibition.

Hysterical anesthesia is a common nervous disorder. An arm or leg feels numb and meanwhile the sense of touch is lost. Hysterical paralysis is no less common; in fact paralysis and anesthesia are commonly associated. A. patient who has suffered the loss of a finger may complain that his whole arm is numb and useless. Elec-

[2]Although no organic cause for cataplexy is known, it has been suggested that the condition is due to vasovagal or periventricular disturbances. The hypothesis can be extended to stammering. Since the cerebral physiology of inhibition is obscure, the present discussion is limited to function.

trical shock frequently produces this phenomenon of inhibition, even when the current is too weak to occasion injury. Catching the sleeve in moving machinery may likewise produce hysterical paralysis even though the arm is untouched.

Inhibition is more common in the learned or conditioned reflexes than in the inborn reaction of breathing, swallowing, voiding, etc. Thus it is common to encounter such inhibitory disturbances as writer's cramp, telegrapher's cramp, and spasms and disabilities in comptometer operators, seamstresses, etc. In these occupational paralyses the hand and arm may function fairly well in ordinary usage but fail by inhibition when performing their specialized movements. There is sometimes an element of fatigue in these situations, but more commonly the precipitating factor is one of emotional stress.

Returning to the subject of speech we may ask ourselves: In what manner, other than stammering, could inhibition of speech manifest itself? Aphonia and dysphonia are merely inhibitory disturbances of the vocal cords, and they relate to vocalization. Complete inhibition of speech is represented by mutism. Partial inhibition, the more common disturbance, is represented by stammering. There is no other known disorder in which partial or transient inhibition of speech can be identified.

A few more generalizations concerning inhibition. Most forms of inhibition are not only total or partial, but they are also variable in their intensity; the resultant functional disorder is therefore a changing phenomenon, and not infrequently it is intermittent. When inhibition manifests itself, there are usually a number of associated disturbances. These consist of abortive responses, attempted compensatory reactions, and expressions of emotional distress. Thus a person affected with hysterial blindness may display a good deal of squinting and blinking and watering of the eyes. The attempt to open the eyes and look at an object may result in marked agitation. When a person suffering from hysterical dysphagia makes the attempt to swallow, he not only makes abortive swallowing movements, but he secretes large quantities of mucus and saliva; he gags and gasps, his eyes water, his face flushes, he breathes rapidly or deeply, and he displays agitation and restlessness. The stammerer manifests similar associated phenomena. Volumes have been written on them, with every detail described from breath holding to *os quadratus*. Many of these phenomena have been interpreted as peripheral disturbances, and the cause of stammering has been sought in the manifestations of stammering itself. Yet the phenomena of stammering appear simple and comprehensible when interpreted in terms of inhibition.

This article does not take into account the distinction between primary and secondary stammering. The distinction is important, but discussion of the subject can be omitted from the present considerations. There is still much to be learned regarding stammering and inhibition. Meanwhile I believe there is a relationship between the two conditions as here presented.

AN ANALYSIS OF THE RELATION BETWEEN HANDEDNESS AND STUTTERING WITH SPECIAL REFERENCE TO THE ORTON-TRAVIS THEORY OF CEREBRAL DOMINANCE[1]

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It is a matter of clinical observation that many stutterers show no evidence of a lack of cortical one-lead dominance. On the other hand, there are many who are either ambidextrous or who have had their handedness shifted who show no defect of fluency in their speech. It accordingly seems logical to follow up these clinical observations with a more systematic study of a large group containing (1) stutterers, (2) left-handed persons, (3) ambidextrous persons, and (4) persons whose handedness had been changed by training or accident, in order to answer such questions as the following:

1. What is the relationship between left-handedness and stuttering?
   a. What per cent of left-handed persons stutter?
   b. What per cent of stutterers are left-handed?
2. What is the relationship between ambidexterity and stuttering?
   a. What per cent of ambidextrous persons stutter?
   b. What per cent of stutterers are ambidextrous?
   c. Is stuttering related to any particular type of ambidexterity?
3. What is the relationship between the shift of handedness and stuttering?
   a. What per cent of shifted persons stutter?
   b. What per cent of stutterers have been shifted in handedness?
   c. Is stuttering related to certain conditions under which the shift takes place?

Because answers to these questions will throw light on the problems raised by many previous investigators, it was decided to make a careful survey of these three relationships.

Arrangements were made to conduct a survey of all the students entering Syracuse University in September, 1939.

The testing procedure of 1,594 entering students secured the data for the conclusions drawn in this survey concerning the relationship between stuttering and handedness.

[1]Submitted in partial fulfillment of the requirements for the degree of Master of Arts in the Graduate School of Syracuse University, 1940.

As a means of analyzing more carefully the different types of handedness in relation to speech, all students who stuttered, who were left-handed, who were ambidextrous, and whose handedness had been changed were selected for further observation in personal interviews.

The sum of these four groups amounted to 216 students. An attempt was made to interview each of these, but due to withdrawals from college, changes in addresses, inaccuracies in the student directory, and failure to make scheduled appointments, it was possible to interview only 154 of these.

The Method of Interviewing

The personal interviews administered to each of these 154 students consisted of the following three parts:

1. The Johnson-Duke Test of Hand Usage.[2]
2. A handedness history questionnaire.
3. A speech test.[3]

Each student was examined and interviewed individually in the School of Speech office. Upon entering the office, the student was asked to be seated at a desk, the center of his body directly opposite a chalk mark made equally distant from the two ends of the desk. The examiner then proceeded to administer the Johnson-Duke Test of Hand Usage. The materials needed for this test were a box of crayons, a pencil, an eraser, scissors, five cards, a tablet of paper, eight blocks, a desk with an open drawer, and a chair for the examiner. Each student performed 27 activities under uniform instruction, in a standard sequence, and under similar conditions. An average of 75 operations was involved in the performance of the 27 activities.

Following is a list of activities in the test; the numbers indicate the usual number of operations for each activity:

Clasping hands	2
Taking articles from desk	4
Tearing paper	1
Putting tablet in desk	1
Turning over paper	1
Raising hand	4

[2]Johnson, Wendell, and Duke, Darlene, "The Dextrality Quotients of Fifty Six-Year-Olds with Regard to Hand Usage," *The Journal of Educational Psychology*, vol. 27, January, 1936, pp. 26–36; Johnson, Wendell, and Davis, Dorothy M., "Dextrality Quotients of Seven-Year-Olds in Terms of Hand Usage," *The Journal of Educational Psychology*, vol. 28, May, 1937, pp. 346–354; Johnson, Wendell, and Duke, Darlene, "Revised Iowa Hand Usage Dextrality Quotients of Six-Year-Olds," *The Journal of Educational Psychology*, vol. 31, January, 1940, pp. 45–52.

[3]The speech test used for entering freshmen at the College of the City of New York. This test was also used by Dr. James F. Bender in his study of the stutterer's personality, entitled *The Personality Structure of Stuttering*, New York, 1939, p. 80.

Picking up pencil	1
Writing	2
Erasing	1
Drawing	1
Putting pencil in desk	1
Opening crayon box	1
Taking out crayons	1+
Coloring	1
Putting crayons in box	1+
Closing crayon box	1
Putting crayon box in desk	1
Picking up scissors	1
Cutting with scissors	1
Putting scissors in desk	1
Pointing to cards and blocks	13
Picking up blocks to build	7 or 8
Placing blocks for building	7 or 8
Picking up blocks to carry	8
Picking up cards	5
Shuffling cards	1
Laying down cards	5

The novelty of the test proved so interesting to the students that spontaneous normal reactions were easily secured. The hand used to perform each definite operation involved in each activity was noted and recorded by the examiner. The test was scored in terms of the dextrality quotient, DQ, which is the percentage of the operations performed by the right hand. The DQ for each student was found by means of the formula: $DQ = \frac{R + \frac{B}{2}}{N}$ in which R and B represent the number of operations performed by the right hand and by both hands, respectively, and N represents the total number of operations performed. The purpose of the test was to apply controlled observational techniques to the problem of measuring, in terms of hand usage, the degree of right-handedness among the students. The exact sequence of activities, the standardized instructions used, and the bases upon which the reliability and validity of the test were established, may be found in the reprint of the test in Appendix A.

The purpose of the handedness history questionnaire was to ascertain significant features in handedness development. The following questions were asked:

1. Has ever your natural handedness been changed in any way?
2. By whom or how?
3. When?

4. Was this change voluntary on your part or was it forced upon you?
5. Do you attribute any ill effects to the change?

Each student was next given a copy of the speech test and asked to follow the instructions printed at the top of the test. The following is a copy of the speech test used:

> *Directions*—Read the following paragraph in a loud, clear voice. When you have read the paragraph, answer the appended question.
>
> Each school child of the United States of America is enjoying a rich privilege. He participates in what is unquestionably the most democratic system of education the world has ever known. Nowhere before have there been presented to a citizenry of all ages so many choice personal advantages. To the grammar school, the high school, the college, the professional school, and the university have been added the kindergarten, the junior high school, the vocational school and the junior college. Quite recently additional educational facilities have been introduced, such as the nursery school and adult educational forums. To be sure not every person in the United States has the advantage or the natural inclination of pursuing a complete and formal education, especially one that extends from nursery school to post-graduate study and specialization in a professional university. But the fact remains that this country is without equal in presenting educational facilities for a number approximately one hundred and thirty million men, women and children.
>
> What are your plans for furthering your vocational objectives?

After the examiner had made a record of the student's speech, the interview was completed. The student was thanked for his co-operation and dismissed.

Results of the Survey Covering 1,594 Cases

The findings from the survey of 1,594 students revealed that the percentage of stuttering was generally typical of those in any large group of college students. For example, the survey reveals 20 stutterers, or 1.3 per cent of the whole group, which is comparable to the following percentages of stuttering among entering classes of other universities.[4]

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[4]Bender, James F., *The Personality Structure of Stuttering*, New York, 1939, p. 2; Travis says: "There is a fairly close agreement among those which have been made all over the world that about 1.0 per cent of the school population are stutterers." (*Speech Pathology*, New York, 1931, p. 97.)

Institutions	*Examiner*	*Percentages of Stuttering*
C. C. N. Y.	V. A. Fields	1.87
Dartmouth	C. H. Voelker	2.60
Univ. of Minn.	B. Bryngelson	2.70
Ohio State Univ.	G. Oscar Russell	2.80
Queens College	J. F. Bender	2.00

Of these 20 stutterers, 15 were boys and 5 girls, a ratio of 3 to 1. Other surveys have revealed a ratio of from 2 to 1, to 10 to 1.[5]

In the group of 20 stutterers the following relationships were observed:

Right-handed stutterers—15 cases or 75 per cent.

Left-handed stutterers—1 case or 5 per cent.

Ambidextrous stutterers—4 cases of 20 per cent.

One hundred and thirty-eight of the 1,594 showed sufficient ambilateral hand preference in the preliminary survey to be classified as ambidextrous persons. The percentages of stutterers and non-stutterers in this group were as follows:

Ambidextrous non-stutterers—134 cases or 97.1 per cent.

Ambidextrous stutterers—4 cases or 2.9 per cent.

Thirty-four students showed a sufficiently marked preference for the left hand to be classified as left-handed. The relationship between stuttering and non-stuttering in this group was as follows:

Left-handed non-stutterers—33 cases or 97.1 per cent.

Left-handed stutterers—1 case or 2.9 per cent.

Of the 1,594 students 1,422 were right-handed. The relationship between stuttering and non-stuttering in this group was as follows:

Right-handed non-stutterers—1,406 cases or 98.9 per cent.

Right-handed stutterers—15 cases or 1.1 per cent.

Seventy-seven of the 1,594 entering students had had their handedness changed. The following relationship existed between stutterers and non-stutterers in this group:

Shifted non-stutterers—76 cases or 98.7 per cent.

Shifted stutterers—1 case or 1.3 per cent.

Results of Personal Interviews of 154 Cases

One hundred and fifty-four persons, consisting of stutterers, left-handed persons, ambidextrous persons, and persons whose handedness had been shifted, were interviewed personally and further tested for the purpose of rechecking the findings of the survey of the original 1,594 entering students. Each of these students was given the Johnson-Duke Test of Hand Usage, a handedness history questionnaire, and a speech test.

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[5]Travis, *op. cit.*, p. 97.

The speech test confirmed in every instance the diagnosis of stuttering or non-stuttering made in the preliminary survey and recheck. It was possible to interview personally 17 of the 20 stutterers revealed by the survey.

The purpose of the handedness history questionnaire was to seek new leads which might throw light on possible relationships between stuttering and shift of handedness. Of the 77 students whose handedness was shifted, 58 were interviewed. Some attention was directed to bringing out the conditions under which the shift was made, with the purpose of discovering whether or not the emotional conditions accompanying the shift were of significance in causing later ill effects, but this particular inquiry led to negative results, as is illustrated in Cases V and VI.

The Johnson-Duke Test of Hand Usage substantiated in general the findings of the survey concerning the relationships between the various types of handedness and stuttering. The observational procedure, however, revealed that the popular concept of kinds of handedness (left-handedness, right-handedness, and ambidexterity) is inaccurate to a degree of becoming almost meaningless. It was shown that three distinct types of handedness groups do not exist: a concept of widely varying degrees of ambidexterity among all individuals more nearly approaches the actual situation.

For example, the group of individuals arbitrarily classified during the survey as left-handed fell, by and large, in the lower portion of the 0 to 100 DQ scale, the median score for this group being 12.9.[6] However, the range of DQ scores of this group was from 0 to 47.9.[7] The handedness characteristics of the group, and the degree of left-handedness varied greatly. Two individuals getting the same handedness score had widely differing handedness characteristics; there are as many possibilities for difference as there are activities observed on the test.

The great variety of handedness usage found within a so-called handedness group is even more clearly illustrated by the 138 cases classified during the survey as ambidextrous. The median score for this ambidextrous group was 42.9 DQ; but the range of DQ scores extended from 2.2 to 94.1. The only common characteristic among this group is the fact that they perform certain manual activities with their right hands and others with their left hands. But as this is the case with every other normal individual tested, no matter what the original classification, the matter of defining types of handedness becomes extremely unstable. The case histories compiled during the study, typical instances of which are cited below, clearly picture this unstability. Many of the students commented during the interview, when asked whether they were right-handed, left-handed,

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[6]For clearness, the DQ scores are represented in integers (25) rather than decimals (.25).

[7]This score of 0 was given to an individual whose right hand had been amputated.

or ambidextrous, that they could answer the question only by telling what activities they did with each hand. No single activity seems adequate to establish handedness; 5 persons who wrote with their right hands had a DQ score of below 20. All sorts of conditions were found among the ambidextrous group; those who had a preferred hand for each activity differed widely in the selection of activities, and a few reported they could perform some activities equally well with with each hand.

In answering the questions raised at the beginning of the study, comparisons are first made using the handedness terms in the "conventional" sense, as it has been used by previous investigators, but the writer is quite aware that differences of opinion regarding what handedness is, unrevealed in the published reports of previous investigators, make comparison difficult.

1. *What is the relationship between left-handedness and stuttering?*

The preliminary survey revealed 34 left-handed individuals; that is, they were left-handed in the three major manual activities questioned and declared themselves to be left-handed. Of this number, only one, or 2.9 per cent, stuttered. The survey, therefore lends no support to the supposed relationship between left-handedness and stuttering. The findings are in definite contrast to those of Scripture, Glogau, and De Bra who reported that out of a group of 55 cases, 92 per cent of the left-handed individuals stuttered.

Twenty-five of this group of 34 left-handed persons were administered the Johnson-Duke test. This group did not include the one individual who was a stutterer, and so the percentage of stuttering among this group of 25 was 0. There were no stutterers whose DQ fell below 43, although there were 70 persons tested whose DQ fell below this figure. The mean DQ score for the group of 25 left-handed persons was 12.9, and the range of DQ's from 0 to 47.9.

The case histories of the individuals in this group show specifically the variation of activities of persons conventionally described as "left-handed." Cases I and II are representative of 33 persons who were considered to be left-handed and who had no symptoms of stuttering.

Case I is a Syracuse University Freshman, 17 years of age. It appears that she is extremely left-handed: her right hand led in none of the activities observed during the hand usage test. Her DQ score was .7. She was prevented from making a perfect left-handed score by the fact that on occasion she used both hands to perform an activity. She eats, combs her hair, sews, plays tennis and ping-pong with her left hand. She has both right- and left-handed relatives. Her teachers in both the first and second grades tried to force her to write with her right hand, but their attempts were unsuccessful; and in subsequent grades the shift was abandoned. During the period of attempted shift and at the present time she does not stutter in either oral reading or in conversation.

Case II is also a University Freshman, 17 years of age. She was classified as left-handed by the survey and she received a score of 7.8 on the hand usage test. During the observation it was noticed that she used the scissors in her right hand, and she told the examiner that she also sewed and knitted with her right hand. Her handedness has never been shifted, and she has no history of stuttering. At the present time she is an unusually fluent speaker, participating actively in the speech activities of the University.

These two cases are similar in that both the survey and in the performances of the handedness test the great majority of activities were performed by their left hands. Case I can, by all probability, be safely classified as a left-handed person. Case II, however, shows certain indications, in spite of her very low DQ, of having ambidextrous tendencies; she performs three highly skilled manual activities with her right hand—sewing, knitting, and cutting with scissors. Here the difficulty of placing individuals into definite handedness groups is illustrated.

2. *What is the relationship between ambidexterity and stuttering?*

The survey of 1,594 students revealed that 138 cases showed adequate ambilateral dexterity to indicate that they were ambidextrous. Four of these 138 persons termed as ambidextrous were stutterers, making the percentage of stuttering among this group 2.9. This percentage is very little higher than the percentage of stuttering found among wholly unselected university groups; as mentioned above, as high as 2.7 per cent and 2.8 per cent of stuttering has been found among the entering classes of the Universities of Minnesota and Ohio State respectively.

When as many as possible of this group of 138 had been given the hand usage test, it was found that the median score was 42.9, and the range of scores of this so-called ambidextrous group was from 2.2 to 94.1.

It is difficult to interpret the relationship between stuttering and handedness in terms of the Johnson-Duke test for two reasons. Firstly, the norms set up by the authors of the test are probably not adaptable for the group studied in this survey because of the differences in the ages of the groups studied: the norms given by Johnson and Duke are for six- and seven-year-olds, while the persons studied in this survey were in their late teens and early twenties. Secondly, the examiner did not administer the hand usage test to a large unselected group of persons comparable in age to the stutterers studied in order to set adequate norms for this survey. It may, however, be significant that the median DQ score for the stutterers studied was not appreciably lower than the median scores of the groups containing no stutterers tested by the authors of the test. The median score for the stutterers examined in this survey was 79.4; the median score for children of six was 78, and, on a slightly altered

version of the test, 82; and for seven-year-olds, the median score was 83.

On examination of the hand usage data, it was found that the stutterers did not tend to fall primarily in the portion of the scale indicative of handedness confusion; in fact, 52.9 per cent of the stutterers received a score of over 85 DQ.

These findings concerning the handedness characteristics of stutterers seem to be in disagreement with the following statement made by Travis: "The most careful laboratory studies show a sinistral or ambilateral nature to be characteristic of most stutterers. However, all studies, including laboratory ones, demonstrate a significant minority of stutterers to be strictly dextral."[8]

The following two case studies show specifically the differences in hand usage which occur between two individuals, both of whom revealed ambidextrous tendencies.

Cases III and IV are individuals which were diagnosed by the survey as being ambidextrous persons. Both cases are non-stutterers. There were 134 cases similarly classified. Upon comparing their performances during the hand usage test, however, it is seen that their handedness characteristics vary widely.

Case III is a graduate student, 22 years of age. Her DQ is exactly 50. Because of training, she writes better with her right hand, but she can write with her left hand also. She eats with her left hand but prefers to hold a glass or cup in her right hand. She deals cards with her right hand, shuffles cards with her left hand, combs her hair with both hands equally well, and uses scissors in her left hand. There are both right- and left-handed persons in her immediate family. She has no history of stuttering and does not stutter in oral reading or conversation.

Case IV is a graduate student, 23 years of age. Before she started school she preferred the use of her left hand, but her mother and father insisted that she eat, brush her teeth, and comb her hair with her right hand. When she started to write in school, she again attempted to use her left hand, but was forced by her teacher to write with her right hand. She now writes with her right hand but prefers her left hand for practically all other activities; she draws, colors, sews, and uses scissors, with her left hand. She has no history of stuttering and is now a non-stutterer in reading aloud and conversation. The shift of handedness was very incomplete in that her DQ is now only 9.5.

In the testing of Case III the survey and the hand usage test agreed in classifying her as an ambidextrous person. Case IV, however, was classified during the survey as being ambidextrous because

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[8]Bender, James F., *The Personality Structure of Stuttering*, New York, 1939, p. 51.

she used her right hand for writing and her left hand for eating, while the hand usage test indicated that she was quite definitely left-handed. The problem again arises as to whether it is more accurate to classify handedness by the number of activities performed by one hand, or by which hand is used to perform certain special skills, such as writing.

3. *What is the relationship between shift of handedness and stuttering?*

Of the 20 stutterers found in the entering class of freshmen, only one was found who reported a shift of handedness. This finding seems extremely significant. Bryngelson, for example, reported that 73.13 per cent of a group of 700 stutterers had had their handedness changed. In other studies he reported 58 per cent and 61 per cent of groups of stutterers had had their handedness shifted. Furthermore, negative evidence is revealed by the findings that 76 individuals in the original group of 1,594 reported a shift of handedness without resulting stuttering.

The personal interviews confirmed this result. It was impossible to administer to the one shifted stutterer the Johnson-Duke test, and so the percentage of stuttering among the shifted people who took the test was 0.

These findings concerning the shift of handedness are illustrated by the two case studies which follow.

Cases V and VI are typical of 76 individuals in the survey who reported that their handedness had been shifted and who showed no signs of stuttering. These two particular cases were chosen because their handedness preference was required to develop under unusually adverse conditions.

Case V is a freshman in Syracuse University, 18 years of age. His relatives are right-handed individuals. At the age of one he contracted infantile paralysis. For one year his right side was paralyzed. At the present time the paralysis is gone, but he uses his left hand for most manual activities; his DQ is 14.8. Because of social custom, he has learned to eat with his right hand; and because of school training he is able to write with both hands, preferring his right. He is a non-stutterer in oral reading and conversation and has no history of stuttering.

Case VI is a freshman, 17 years old. Before she started school her parents noticed that she had a strong preference for her left hand. An uncle who was living in the home felt that left-handedness would be a handicap to her, and so he took pains to shift her handedness. He would slap her left hand when she reached for an object with it, and he taught her to write right-handed with her left hand tied behind her back. By the time she started school the shift was practically complete, and she now presents a picture of decided right-handedness; her DQ is 96.6. She still brushes her teeth and washes

dishes with her left hand. She has no history of stuttering and does not stutter while reading or conversing.

These two cases also illustrate the difficulty of accurate handedness terminology. Case V was classified during the survey as ambidextrous because he ate and wrote with his right hand but threw a ball with his left hand; the hand usage test indicated that he was left-handed because of his very low dextrality quotient; but perhaps if his handedness had been allowed to develop normally, he would have been a predominately right-handed person.

Case VI was termed right-handed by both the survey and the test of hand usage. The fact, however, that she still performs with her left hand several activities demanding skill (brushing teeth and washing dishes) which were not included on either test, and that the hand usage test showed a slight tendency toward a left-handed lead in simple spontaneous acts (such as putting articles in the desk) may indicate that on a test which was made up of activities not so definitely influenced by school training, her handedness might show marked signs of confusion.

Questions Raised by the Study

A number of interesting questions are raised by the survey. Before further research concerning the relationship between handedness and stuttering is undertaken, handedness itself must be more clearly understood to make statements concerning its influence on other phenomena significant. Still better tests of handedness need to be worked out, through careful research, that will take into consideration factors both of heredity and of environment.

The present study thus lends little or no support to many relationships commonly reported as existing between handedness and stuttering. Much further research needs to be done, however, in definition of the concept of handedness, in devising methods of testing and scoring, and in studying the development of handedness. If the implications pointed out by this study are confirmed, certainly, in the treatment of stuttering, the speech clinician can find little support for therapeutic measures which largely involve training or retraining habits of hand usage.

APPENDIX A

The Johnson-Duke Controlled Observation of Selected Hand Activities

"Please sit down behind this desk and *fold your hands* while I write your name. (Note which thumb is uppermost when hands are folded. The hands should be folded in such a way as to interlace the fingers. If the child fails to fold the hands this way he may be prompted to do so.) Now will you please *take the articles out of the desk* one at a time and place them on the desk." (Make one observation for each article taken from the desk.)

The tester picks up the articles and places the tablet directly in front of the child, so that it is as easily reached with one hand as the other, and says, "Please *tear out one sheet of paper. Then put the tablet in the desk. Turn the paper over* and when you are through *raise your hand.*"

The tester next places the pencil directly in front of the child (note the hand used in *taking the pencil*) and continues: "*Write* your name at the top of the paper. No, *erase* it and *write* it at the bottom of the sheet. When you are through *raise your hand.* Now will you please *draw* a picture and when you have finished *put your pencil in the desk* and *raise your hand.*"

Next, a box of crayons is placed directly in front of the child by the tester who says: "Now *color the picture.*" (Note which hand is used in *opening the box*, in *taking each crayon out*, in *coloring*, in *placing each crayon in the box*, and in *closing the box.*) "When through *place the crayon box in the desk* and *raise your hand.*"

For the next activity the tester places the scissors directly in front of the child. (Note which hand is used in *taking the scissors.*) "Cut off the bottom line. Then *put the scissors in the desk* and *raise your hand.* Now *fold your hands* while I put the blocks on the desk."

Next the tester places the eight blocks in a straight line from one side to the other as near the middle of the desk as possible, and then says: "*Point to A, point to M*, etc.," (allowing an interval of one or more seconds to elapse between commands. Do not call off the blocks in order of arrangement. See that the child gets his hands in a resting position or folded before calling of the next block. There will be eight observations for this activity.) "Now, pile up the blocks one on top of the other, making a pile eight blocks high, being careful to pick up one block at a time." (Note the hand used in *picking up each block* and in *placing* it. There will be seven or eight observations for each of these activities, depending upon whether the child moves the first block.) The tester again lays the blocks on the desk saying:

"Please carry these over to another desk one at a time," (or any other convenient spot. Note the hand used in *picking up the blocks.* There will be eight observations for this activity.)

Finally, the tester places five cards across the top of the desk, saying to the child: "*Point* to the cards as I name them. Please *pick* them up one at a time, *shuffle* them and *lay them down* one at a time." (There will be five observations for each activity; pointing, picking up cards, laying down cards.)

This concludes the test. The tester should be perfectly free to carry on additional conversation, letting the child respond spontaneously to any of the situations which arise, as this will bring forth a more normal reaction.

Reliability.—This test was administered to fifty six-year-old first-grade children. As a check on the consistency of performance the test was given a second time to the same children. The coefficient of correlation between the DQ's of each child for the first test and the retest was .92 ± .015, and between the DQ's for each activity as performed by all the children for T_1 and T_2 was .94 ± .015. Differences between DQ's for T_1 and T_2 for each child in performing all activities and for each activity as performed by all children were computed and the PE of each difference was determined. Forty-nine of fifty children did not present statistically significant differences in DQ from T_1 to T_2. For no activity was there a statistically significant difference in DQ from T_1 to T_2. Thus the reliability of the test may be regarded as high.

Internal Consistency.—As a measure of internal consistency of the test, there was computed the average DQ of each activity as performed by the forty per cent of the subjects scoring the highest DQ's for the test as a whole, and as performed by the forty per cent scoring the lowest DQ's. The difference between these averages for each activity and the PE of the difference were determined. For all but eight of the activities statistically significant differences were found. For all but four activities the difference was more than twice as large as the PE of the difference. These findings may be regarded as indicative of a high degree of internal consistency of the test, particularly in view of the necessarily small size of the two compared groups and the relatively small difference between these groups with regard to degree of right handedness as measured by the test as a whole.[9]

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[9]Johnson, Wendell, and Duke, Darlene, "The Dextrality Quotients of Fifty Six-Year-Olds with Regard to Hand Usage," *The Journal of Educational Psychology*, vol. 27, January, 1936, pp. 26–35.

APPENDIX B

Results of Johnson-Duke Test of Hand Usage Administered to 154 Selected Cases

Number	*DQ*	*Stutterers*	*Non-Stutterers*	*Shift*	*No Shift*
1.	0	...	x	...	x
2.	.7	...	x	...	x
3.	.7	...	x	...	x
4.	2.2	...	x	...	x
5.	2.2	...	x	...	x
6.	2.9	...	x	...	x
7.	3.6	...	x	...	x
8.	5.8	...	x	...	x
9.	7.8	...	x	...	x
10.	8.4	...	x	...	x
11.	8.5	...	x	...	x
12.	9.5	...	x	x	...
13.	9.7	...	x	...	x
14.	11.1	...	x	...	x
15.	12.1	...	x	...	x
16.	12.5	...	x	x	...
17.	12.9	...	x	...	x
18.	13.9	...	x	...	x
19.	14.7	...	x	...	x
20.	14.8	...	x	...	x
21.	17.0	...	x	...	x
22.	17.6	...	x	x	...
23.	18.6	...	x	...	x
24.	19.7	...	x	x	...
25.	20.4	...	x	...	x
26.	21.1	...	x	x	...
27.	22.6	...	x	x	...
28.	22.8	...	x	...	x
29.	22.8	...	x	x	...
30.	23.1	...	x	x	...
31.	23.2	...	x	x	...
32.	23.4	...	x	...	x
33.	24.2	...	x	...	x
34.	24.6	...	x	...	x
35.	25.7	...	x	...	x
36.	25.9	...	x	...	x
37.	26.4	...	x	...	x
38.	26.7	...	x	...	x
39.	28.2	...	x	x	...
40.	29.1	...	x	...	x
41.	29.4	...	x	...	x
42.	29.8	...	x	x	...
43.	30.0	...	x	x	...
44.	30.2	...	x	...	x

Number	*DQ*	*Stutterers*	*Non-Stutters*	*Shift*	*No Shift*
45.	30.9	...	x	...	x
46.	31.6	...	x	x	...
47.	31.8	...	x	...	x
48.	32.3	...	x	...	x
49.	33.3	...	x	x	...
50.	33.5	...	x	...	x
51.	34.4	...	x	...	x
52.	34.5	...	x	...	x
53.	35.2	...	x	x	...
54.	35.2	...	x	...	x
55.	35.2	...	x	...	x
56.	35.4	...	x	x	...
57.	37.2	...	x	...	x
58.	37.5	...	x	...	x
59.	38.2	...	x	x	...
60.	38.5	...	x	x	...
61.	38.8	...	x	...	x
62.	39.4	...	x	...	x
63.	39.6	...	x	x	...
64.	39.6	...	x	x	...
65.	39.7	...	x	...	x
66.	40.1	...	x	...	x
67.	41.1	...	x	x	...
68.	41.1	...	x	x	...
69.	41.7	...	x	x	...
70.	41.9	...	x	x	...
71.	42.9	...	x	...	x
72.	43.0	...	x	x	...
73.	43.0	x	...	...	x
74.	43.3	...	x	...	x
75.	43.7	x	...	...	x
76.	45.1	...	x	x	...
77.	45.5	...	x	...	x
78.	45.7	...	x	x	...
79.	46.4	...	x	...	x
80.	46.7	...	x	x	...
81.	47.0	...	x	x	...
82.	47.1	...	x	...	x
83.	47.2	...	x	...	x
84.	47.9	...	x	...	x
85.	49.2	...	x	x	...
86.	49.2	...	x	x	...
87.	49.2	...	x	...	x
88.	50.0	...	x	x	...
89.	50.0	...	x	x	...
90.	50.0	x	...	...	x
91.	50.7	...	x	x	...
92.	50.9	...	x	x	...
93.	51.4	...	x	...	x
94.	51.4	...	x	x	...
95.	51.4	...	x	...	x
96.	52.0	...	x	...	x
97.	52.0	...	x	x	...

Number	DQ	Stutterers	Non-Stutterers	Shift	No Shift
98.	52.1	...	x	x	...
99.	52.2	x	...	...	x
100.	52.9	...	x	...	x
101.	53.5	...	x	x	...
102.	53.6	...	x	x	...
103.	54.2	...	x	x	...
104.	56.3	...	x	...	x
105.	56.6	...	x	x	...
106.	56.6	...	x	x	...
107.	58.8	x	...	...	x
108.	59.4	...	x	x	...
109.	59.6	...	x	x	...
110.	60.2	...	x	x	...
111.	61.1	...	x	...	x
112.	61.7	...	x	...	x
113.	62.3	...	x	...	x
114.	63.3	...	x	x	...
115.	64.4	...	x	...	x
116.	65.2	...	x	...	x
117.	66.1	...	x	...	x
118.	66.6	x	...	...	x
119.	67.6	...	x	x	...
120.	67.6	...	x	...	x
121.	70.1	...	x	x	...
122.	70.5	...	x	x	...
123.	70.7	...	x	...	x
124.	71.7	...	x	...	x
125.	72.0	...	x	...	x
126.	73.5	...	x	...	x
127.	73.5	...	x	x	...
128.	73.5	x	...	...	x
129.	73.6	x	...	...	x
130.	74.3	...	x	...	x
131.	78.9	...	x	x	...
132.	80.8	...	x	x	...
133.	80.9	...	x	x	...
134.	81.1	...	x	x	...
135.	81.3	...	x	x	...
136.	82.4	...	x	...	x
137.	83.0	...	x	x	...
138.	85.1	x	...	...	x
139.	85.2	x	...	...	x
140.	85.4	...	x	...	x
141.	85.5	...	x	...	x
142.	87.5	x	...	...	x
143.	88.0	x	...	...	x
144.	90.6	x	...	...	x
145.	91.3	x	...	...	x
146.	91.9	x	...	...	x
147.	92.6	...	x	...	x
148.	94.1	...	x	...	x
149.	96.0	x	...	...	x
150.	96.6	...	x	...	x
151.	97.0	...	x	...	x
152.	97.0	x	...	...	x
153.	98.0	...	x	x	...
154.	98.6	...	x	...	x

BIBLIOGRAPHY

Books and Monographs

Bender, James F. *The Personality Structure of Stuttering*, New York, Pitman Publishing Corporation, 1939.

Bender, James F., and **Kleinfield, V. M.** *Principles and Practices of Speech Correction*, New York, Pitman Publishing Corporation, 1938.

Blanton, Margaret G., and **Blanton, Smiley.** *For Stutterers*, New York, D. Appleton Company, 1936.

Bluemel, Charles Sidney. *Stammering and Allied Disorders*, New York, The Macmillan Company, 1935.

Borden, Richard C., and **Busse, Alvin C.** *Speech Correction*, New York, F. S. Crofts and Company, 1928.

Fletcher, John Madison. *The Problem of Stuttering*, New York, Longmans, Green and Company, 1928.

Haefner, R. *The Educational Significance of Left-Handedness*, New York, Teachers College Contribution to Education, No. 360, 1929.

Johnson, Wendell. *Because I Stutter*, New York, D. Appleton Company, 1930.

Murchison, Carl. Editor, *Handbook of Child Psychology* (2nd ed.), Worcester, Clark University Press, 1933.

Orton, J. Louis. *The Cure of Stammering, Stuttering, and Other Functional Speech Disorders*, London, Thorsons, 1930.

Orton, Samuel T. *Reading, Writing, and Speech Problems in Children*, New York, W. W. Norton and Company, Inc., 1927.

Parson, Beaufort Sims. *Left-Handedness*, New York, The Macmillan Company, 1924.

Scripture, Edward Wheeler. *Stuttering and Lisping*, The Macmillan Company, 1923.

Selyer, G. A. *Lateral Dominance and Visual Fusion, Their Application to Difficulties in Reading, Writing, and Speech*, Cambridge. The Harvard University Press, 1933.

Stinchfield, Sara. *Speech Disorders*, New York, Harcourt, Brace and Company, 1933.

Travis, Lee Edward. *Speech Pathology*, New York, D. Appleton and Company, 1931.

Van Riper, Charles. *Speech Correction*, New York, Prentice-Hall, Inc. 1939.

West Robert. Editor, *Proceedings of the American Society for the Study of the Disorders of Speech*, vol. 1, 1930–1931; vol. 4, 1934.

West, Robert; Kennedy, Lou; and **Carr, Anna.** *The Rehabilitation of Speech*, New York, Harper and Brothers, 1937.

Periodicals

Ballard, P. B. "Sinistrality and Speech," *The Journal of Experimental Pedagogy*, vol. 1, 1912, pp. 298–310.

Bluemel, Charles Sidney. "Dominant Gradient in Stammering," *The Quarterly Journal of Speech*, vol. 19, April, 1933, pp. 233–242.

Brown, F. W. "Stuttering: Its Neuro-physiological Basis and Probable Causation," *American Journal of Orthopsychiatry*, vol. 2, October, 1932, pp. 363-420

Bryngelson, Bryng. "A Study of Laterality of Stutterers and Normal Speakers," *The Journal of Speech Disorders*, vol. 4, September, 1939, pp. 231–234.

Bryngelson, Bryng, and **Rutherford, Berneice.** "A Comparative Study of Laterality of Stutterers and Non-Stutterers," *The Journal of Speech Disorders*, vol. 2, March, 1937, pp. 15–17.

Berry, Mildred Freberg. "A Common Denominator in Twinning and Stuttering". *The Journal of Speech Disorders*, vol. 3, March, 1938, pp. 51–57.

Claiborne, J. H. "Stuttering Relieved by Reversal of Manual Dexterity," *New York Medical Journal*, vol. 105, 1917, pp. 577–581, 619–621.

Downey, J. E. "Types of Dextrality and Their Implications". *The American Journal of Psychology*, vol. 38, 1927, pp. 317–367.

Fagan, L. B. "Relation of Dextral Training to the Onset of Stuttering," *The Quarterly Journal of Speech*, vol. 16, February, 1931, pp. 73–76.

Heltman, Harry J. "The Psycho-Social Phenomena of Stuttering," *The Journal of Social Psychology*, vol. 9, 1938, pp. 79–96.

Hunsley, Y. L. "Dysintegration in the Speech Musculature of Stutterers During the Performance of a Non-Vocal Temporal Pattern," *Psychological Monographs*, vol. 49, 1937, pp. 32–49.

Jasper, H. H. "A Laboratory Study of Diagnostic Indices of Bilateral Neuromuscular Organization in Stutterers and Normal Speakers". *Psychological Monographs*, vol. 53, 1932, pp. 72–83.

Johnson, Wendell, and **Davis, Dorothy M.** "The Dextrality Quotients of Seven-Year-Olds in Terms of Hand Usage," *The Journal of Educational Psychology*, vol. 28, May, 1937, pp. 346–354.

Johnson, Wendell, and **Duke, Darlene.** "The Dextrality Quotients of Fifty Six-Year-Olds with Regard to Hand Usage," *The Journal of Educational Psychology*, vol. 27, January, 1936, pp. 26–36.

Johnson, Wendell, and **Duke, Darlene.** "Revised Iowa Hand Usage Dextrality Quotients of Six-Year-Olds," *The Journal of Educational Psychology*, vol. 31, January, 1940, pp. 45–52.

Jordan, H. E. "The Crime Against Left-Handedness," *Good Health*, vol. 57, 1914, pp. 378–383.

Makuen, G. H. "A Study of 1,000 Cases of Stammering," *Therapeutic Gazette*, vol. 38, 1914, pp. 385–390.

Jastak, Joseph. "The Ambigraph Laterality Test," *The Journal of Applied Psychology*, vol. 22, 1939, pp. 473–487.

Nice, M. "Ambidexterity and Delayed Speech Development," *Pedagogical Seminary*, vol. 25, 1918, pp. 141–162.

Oates, E. W. "Left-Handedness in Relation to Speech Defects, Intelligence, and Achievement," *Forum of Education*, vol. 7, 1929, pp. 91–105.

Scripture, M. K.; Glogau, O.; De Bra, A. H. "Left-Handedness as an Etiological Factor in Speech Defects," *Laryngoscope*, vol. 27, 1917, pp. 157–169.

Strother, Charles. "A Study of the Extent of Dyssynergia Occurring During the Stuttering Spasm," *Psychological Monographs*, vol. 49, 1937, pp. 108–127.

Terman, L. M. "The Hygiene of the School Child," *The Journal of Experimental Pedagogy*, vol. 1, 1912, pp. 345–346.

Tompkins, E. "Left-Handedness and Stammering," *Quarterly Journal of Speech Education*, vol. 5, January, 1919, pp. 6–11.

Travis, Lee Edward. "Dissociation of Homologous Muscle Function in Stuttering," *The Archives of Neurology and Psychiatry*, vol. 31, January, 1934, pp. 127–133.

Travis, Lee Edward, and **Johnson, Wendell.** "Stuttering and the Concept of Handedness," *Psychological Review*, vol. 41, 1934, pp. 534–561.

Travis, Lee Edward, and **Knott, John R.** "Bilaterally Recorded Brain Potentials from Normal Speakers and Stutterers," *The Journal of Speech Disorders*, vol. 2, December, 1936, pp. 239–241.

Travis, Lee Edward, and **Lindsley, Donald.** "An Action Current Study of Handedness in Relation to Stuttering," *The Journal of Experimental Psychology*, vol. 16, April, 1933, pp. 258–270.

Van Dusen, Clarence R. "A Laterality Study of Stutterers and Non-Stutterers," *The Journal of Speech Disorders*, vol. 4, September, 1939, pp. 261–265.

Van Riper, Charles. "A New Test of Laterality," *Journal of Experimental Psychology*, vol. 17, 1934, pp. 305–313.

West, Robert. "A Neurological Test for Stutterers," *The Journal of Neurology and Psychopathology*, vol. 38, 1929, pp. 114–123.

Woldstad, D. "Stuttering and Left-Handedness," *School and Community*, vol. 17, September, 1931, pp. 310–313.

Whipple, G. M. "The Left-Handed Child," *The Journal of Educational Psychology*, vol. 2, 1911, pp. 1–17.

CONTRADICTORY EVIDENCE IN HANDEDNESS AND STUTTERING

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For nearly thirty years, beginning with Whipple in 1911, who found evidence of retarded speech development following compulsory use of the right hand, and coming down to September, 1939, when Bryngelson reported a study of 152 stutterers in which he found that 34 per cent were ambidextrous, and that 61 per cent had been shifted from left to right, there has been a continuous bombardment of speech therapists, educators, and laymen with evidence which seemed to prove that, so far as speech is concerned, a shift of handedness is fraught with grave danger, if not certain disaster.

My own position in the matter, since I had never had an adequate opportunity for an objective study, has been one of agnostic aloofness. Many times I have been asked by teachers whether a child should be taught to use his right hand in learning to write. Invariably I have replied with the question: "How do your school authorities stand on the matter?" and almost as invariably I have been told that they are against it. In such cases I have played safe by advising that the wishes of the authorities should be respected. And yet I have paid only lip-service to the custom, because, up to now, it hasn't seemed to me to be very important one way or the other which hand a person uses in writing, aside from the inconvenience of trying to write a right-hand script with the stylus in the left hand. Numbers of the teachers who have made inquiry are old in service and have changed hands for writing in many children, in the days before the taboo went into effect, and according to their testimony, without any untoward result.

Furthermore, I have heard school superintendents say that their experience has taught them that there is no more than a rarely occasional adverse reaction to the practice of changing, but that rather than run the risk of injury to a pupil, they were willing to listen to the child specialist. This point of view is in keeping with my own. For over ten years I have been polling my classes to find who was changed in childhood, and whether there were evidences of stuttering following the change. Some have reported that they did begin to stutter, but by far the greater number seemed to have suffered no ill effects at all. Of course this was purely subjective evidence.

On the other hand, all the scientific investigations seem to support the theory that there is causal relationship between the shift of hand, particularly for writing, and the onset of stuttering. The fact, as West pointed out ten years ago, that there is twice as much stuttering in children in the fifth grade as in the first, where writing begins, and

that there is a gradual increase in the frequency from the time the child enters school up to the time of this maximum, did not seem to the investigators, to bear the slightest relationship to the results. Nor did these investigations ever turn attention to the variable ten to seventy per cent, (depending on the particular study) which do not support the theory of causal relationship between shift and stuttering, to find whether there may not be some other than the stated cause operating to produce the speech disorder.

It so happens that Syracuse University has a convenient means for obtaining data on speech disorders among the student body. The comprehensive entrance examination of all students includes among other things, health, sight, hearing, and speech. With a view to making data on handedness available for graduate research, there was included in the fall of 1939 a questionnaire on dexterity and shift of hand. Using this material as a basis, Elizabeth Daniels, of Brooklyn, has completed a report of her own investigation under the title: "An Analysis of the Relation between Handedness and Stuttering with Special Reference to the Orton-Travis Theory of Cerebral Dominance." In the meantime, it would appear that another study was in process which was reported by Clarence R. VanDusen, in the September 1939 number of the Journal of Speech Disorders, under the title: "A Laterality Study of Stutterers and Non-stutterers." It is my purpose in this paper to report the findings of Miss Daniels, which, in the main, support VanDusen, and in addition point out the contradictions to the conclusions of Orton, Travis, Bryngelson, and others, and also to call attention to possible therapeutic implications.

VanDusen, from a study of 40 right-handed college male stutterers, and 40 right-handed college male non-stutterers, thus concludes: "There are no significant differences between the two groups in laterality, lead, speech, and accuracy." Daniels found *from a study of 20 stutterers, and 77 cases of a shift of handedness for writing, no significant difference in the frequency of stuttering among those shifted, and among all the students entering Syracuse University for the first time, in September,* 1939.

In order to determine, if possible, the dexterity tendencies the following questionnaire was used:

1. Are you right or left-handed?
2. With which hand do you write?
3. With which hand do you use your knife in cutting food?
4. With which hand do you throw a ball? (Men).
   use a needle? (Women).
5. Were you ever changed from left to right hand?
6. If so, approximately how old were you when the change was made?

Out of 1,594 entering students, 216 were selected and re-checked before leaving the examination, as having been found by the dexterity questions to be either left-handed, ambidextrous, or to have been shifted. In this number, the twenty cases of stuttering were included also.

With this data at hand, Daniels set out to answer, if possible, the following questions:

1. What is the relationship of left-handedness to stuttering?
   a. What per cent of left-handed persons stutter?
   b. What per cent of stutterers are left-handed?
2. What is the relationship of ambidexterity to stuttering?
   a. What per cent of ambidextrous stutter?
   b. What per cent of stutterers are ambidextrous?
   c. Is stuttering related to any particular degree of ambidexterity?
3. What is the relation between hand-shift and stuttering?
   a. What per cent of hand-shifted stutter?
   b. What per cent of stutterers have been shifted?
   c. Is stuttering related to conditions surrounding shift?

Of the original 216 selected on the basis of dexterity and stuttering tests at the entrance examination, Daniels succeeded in recalling a total of 152, in March and April, 1940, for a re-test and another interview. The following questions were asked of each interviewee:

1. Has your natural handedness been changed in any way?
2. By whom, or how?
3. When was the change made?
4. Was the change voluntary, or forced on you?
5. Do you attribute any ill effects to the change?

This part of the interview was followed by the Johnson-Duke Test of Hand Usage as reported in 1936. It includes 27 activities with an average of 75 operations. During the interview, and by a formal test including reading aloud and conversation, all cases were again examined for stuttering. Her results verified the original entrance examination findings as to the stuttering, and in general, the dexterity classifications. Let us now compare the results of the entire investigation with the definitely contradictory findings of Bryngleson as reported in the Journal of Speech Disorders for September, 1939. The differences in the groups studied should be kept in mind.

Bryngelson group: 74 normals, 74 stutterers, ages 4 to 16.
78 normals, 78 stutterers, ages 17 to 31.

Daniels: All (1,594) entering students, Syracuse University, September, 1939. 20 stutterers discovered.

Bryngelson: 94% of normals right-handed.

Daniels: 98.9% of normals right-handed.

Per cent of stutterers who are:	*Bryngelson*	*Daniels*
Right-handed	63%	75%
Left-handed	3%	5%
Ambidextrous	34%	20%
Shifted	61%	5%
Family-history left	64%	not taken
Family-history stuttering	51%	not taken

Furthermore, from the results of the Johnson-Duke Test of Hand Usage, Daniels concluded: " . . . that the popular concept of kinds of handedness is inaccurate to a degree of becoming almost meaningless. It was shown that *three distinct types of handedness groups do not exist*: a concept of widely varying degrees of ambidexterity among all individuals more nearly approached the actual situation." The two significant differences in this comparison are the substantially lower frequency (B. 34; D. 20%) of ambidextrous and the vast difference (B. 61; D. 5%) of the shifted.

Abandoning the comparison where the differences of the findings between two investigators might be explained by a difference of definition, diagnosis, or method, let us consider the Daniels data in terms of the general theory of the causal relationship between dexterity and stuttering, with particular reference to a shift of handedness as *the* exciting cause.

Among the 1,594 entering students, 20, or 1.3% were picked out as stutterers. Compared with the frequencies in other universities and colleges for all students, as reported by Bender, this is from one-half to one and one-half per cent low:

C. C. N. Y., 1.87; Dartmouth, 2.60; U. of Minn., 2.70; O. S. U., 2.80; Queens, 2.00.

The relatively small number at Syracuse may be due to the fact that the testing was not done entirely by skilled diagnosticians. Out of the eight who conducted the examination, four were but recent students in the courses in speech correction. It may be assumed, therefore, that the cases discovered were serious enough to be easily detected; and since the re-test by Daniels corroborated the earlier one, the possible error is not significant. Other findings are as follows:

Of the 1,594 students examined,

1,422 were classed as right-handed.
138 were classed as ambidextrous.
34 were classed as left-handed.
77 had been changed from left to right-hand, at least for writing.

Of the 1,422 right-handed,	15, or 1.1% stutter.
138 ambidextrous,	4, or 2.9% stutter.
34 left-handed,	1, or 2.9% stutter.
77 shifted,	1, or 1.3% stutter.

Now, if the findings of Daniels, as reported here, are valid, as they appear to be, the following significant conclusions may be ventured:

(1) Since 76 out of 77 of the entering group were changed from left to right-handed, for writing, then, for this particular group *there was no hazard in making the change.*

(2) Since, out of the 77 who were changed for writing, only one was ever conscious of being a stutterer, or was diagnosed as

a stutterer, and since the percentage of 1.3 does not vary significantly from the 1.1% of right-handed, and the 1.3% of the entire group who stutter, the appearance of stuttering in this student as a child, if it did appear during the process of the change of handedness, *could not be attributed to the fact of change.*

(3) Since the frequency of stuttering, among the ambidextrous 2.9%, is over twice as great in this particular group, as among those who were shifted, then *it may have been advisable, as a preventive measure against stuttering, to have taught all the ambidextrous of last year's entering class at Syracuse University, to write with their right hands.* Incidentally, such a procedure would have been in keeping with the conventional therapy of establishing and strengthening a dominant lead in ambidextral stutterers.

(4) Since the frequency of stuttering among the left-handed, 2.9%, is over twice as great in this particular group, as among those who were shifted, *it may have been good hygiene had they been taught to write with their right hands.*

In other words, based on Daniels' study, it might have been good hygiene, as well as good pedagogy, to have taught to write with their right hands when they were learning this skill, all the one time children who entered Syracuse University as students in the fall of 1939.

Obviously, these conclusions are purely speculative. Only repeated yearly studies of entering classes, with comparable results, will justify a revision of the techniques of education and therapy now in vogue, which are based on the cerebral dominance theory. And yet, the proponents of that theory might well examine again their conclusions, particularly with regard to treatment and procedures under the premises. For example, (1) is it not possible that many of the findings in support of the theory of causal relationship between handedness and stuttering may be drawn from the atypical, instead of the typical, in spite of the controls? (2) Is it not possible that the almost hysterical fear of a change of handedness in writing, which has resulted in the general abandonment of a not inconsiderable literary convenience, is the direct result of an over-solicitude for the one case in seventy-seven atypically-handed who is *at the same time* a stutterer? And since the Daniels study indicates that, at least in one group of people, there are over twice as many stutterers among left-handed and ambidextrous as among right-handed and shifted. (3) Is there not at least a remote likelihood that *the difficulty of getting adjusted to a right-handed world* might contribute a little something to the development of stuttering? (4) And is there not, say, one chance in a dozen or fifty, that the reported effectiveness of the return-to-dominant-hand therapy may be due to some other factors than the mere fact of the return?

REPORT OF THE 1940 ANNUAL BUSINESS MEETING

(*Continued from page 294*)

"Whereas, in the past war an acute problem of placement of these handicapped persons existed and only a makeshift solution of the problem was possible due to inadequate personnel and lack of proper preparation for handling of these cases, and

"Whereas, speech disabilities arising from military service in war constitute numbers of problems in addition to those ordinarily found in the general population, and

"Whereas, a national emergency exists in which the man power of the nation is being called to serve,

"*Therefore, Be it Resolved,* by vote of the Fellows of the American Speech Correction Association that the Association place its collective and individual services at the disposal of the War Department of the United States, endorsing the principle in that manner which will be of best service to the nation."

It was suggested that this resolution be sent to persons deemed advisable by the president. The following suggestions were offered: Secretary of War, President of the United States, Surgeon General, Dr. Bingham, and Dr. Miles.

The Constitution was amended so as to authorize the election of a Second Vice-President who shall be ex-officio chairman of the Program Committee. Another amendment was passed authorizing the secretary to include in the annual Membership List all old members whose dues through the preceding year have been paid, even though current dues remained unpaid when this List went to press on Feb. 1. The following amendment was also passed: "If an officer or committee member fails to appear at two consecutive annual conventions, his office shall be declared vacant by the Council."

The Council elected the following Fellows: Margaret E. Hall, Ph. D., Dorothy M. Davis, Ph. D., Arthur Dick, M. D., and Edwin B. Twitmyer, Ph. D.

Samuel D. Robbins, *Secretary.*

A STUDY OF THE DURATION OF TEMPORAL INTERVALS BETWEEN SUCCESSIVE MOMENTS OF STUTTERING

KATHERINE PITTENGER[1]

I. Introduction

In this study the duration of time intervals between successive moments of stuttering was determined in order to discover whether or not there existed any systematic distribution of the extents of these time intervals or any cyclic pattern of a temporal nature in the occurrence of stuttered moments. The temporal intervals treated here in detail extended from the beginning of one moment of stuttering to the beginning of the next. The fluent intervals, that is, those intervals extending from the end of one moment of stuttering to the beginning of the next, were also analyzed, but the results were so definitely similar that only the first mentioned intervals will be considered in detail in this report.

II. Problem

The following questions were formulated to be answered by this study:

1. Do the time intervals between successive moments of stuttering tend to be the same or different in length for a given individual?
2. Do the time intervals between successive moments of stuttering tend to follow any sort of cyclic pattern? (A cyclic pattern is here defined as any sort of relative consistency in the lengths of successive temporal intervals.)
3. Do the time intervals between moments of stuttering show any marked variation in size from one individual to another?
4. What is the degree of relationship between mean duration of temporal intervals between beginnings of moments of stuttering and variability in duration of these intervals?

III. Apparatus and Procedure

Twenty stutterers, ranging in age from 15 to 34 years, served as subjects for this experiment. Each subject was seated in a relatively sound-proof room and asked to read a one-thousand word standard passage placed before him. As he read, he was observed by two observers of whom he was unaware, who were stationed throughout the experiment in a dark room outside the one-way vision window of the sound-proof room. A monitor amplifier hooked to the output

[1]This study was done at the University of Iowa and was directed by Wendell Johnson. Dr. John R. Knott supervised technical laboratory operations. Mr. William E. Colley and Mr. Hollis Hamstra assisted in the collection of data.

lead of the intercommunication system enabled the observers to hear the subject read.

Each observer pressed an individual mercury key every time the subject stuttered, and held down the key for the duration of the stutter, using both visual and auditory cues in order to judge whether or not stuttering was occurring. Visual cues consisted of the facial and mouth distortions and bodily movements that the observers saw the subject make, and auditory cues were mainly repetitions, prolongations, interjections, and stoppages of sounds.

The mercury keys were constructed by Colley (1); they are particularly useful in a two-observer situation because they are noiseless. When an observer pressed the key, a circuit was completed and the current thus generated activated one of the elements on a four-element, ink-writing oscillograph. When this element was activated it caused the pen which it governed to make a deflection on a tape running through the oscillograph. A polygraph and oscillograph were used for recording, both being run by a constant speed electric motor which regulated the speed with which the five-inch tape ran through the two machines at 30 millimeters a second.

On both signal-key lines the distance from the beginning of one deflection to the beginning of the next was measured in millimeters, which were then translated into seconds. This was done for three records, and in these measurements only those deflections were included which represented moments of stuttering observed by both observers. The degree of agreement between the observers was then measured in terms of the Pearson product moment coefficient of correlation, the time intervals marked by one observer being correlated with those marked by the other, and an r of .99+.001 was obtained. Only the writer's signal-key line was measured on the other records, and only those moments of stuttering recorded by both observers were included.

The number of seconds between the beginnings of successive moments of stuttering was set down for each individual. Graphs were made in which the size of temporal intervals was represented along the ordinate and the intervals in successive order of their occurrence were distributed along the base line. Such a graph was made for each of the twenty subjects. The raw data were plotted first and the resulting curve was smoothed by a three-point moving average curve superimposed on the first one.

The arithmetic mean and the median and the standard deviation, range, and first and third quartiles were computed for each distribution as measures of central tendency and variability, respectively, and Pearson's coefficient of variation was used as a measure of relative variability since it takes account of both the central tendency and variability, and measurements of the type utilized here involve an absolute zero and a unit that is constant from one point on the scale to another. As stated before, the same statistical treatment was applied to the fluent time intervals. The means, ranges, and coefficients of variation for both sets of data were compared in terms of the Pearson product moment coefficient of correlation. The resulting

coefficients of .99, .96, and .80 illustrate the similarity between the time intervals including, and those excluding, the moment of stuttering.

In interpreting the graphs it was necessary to have some criterion for judging whether or not a cyclic pattern was present. Heart beat is assumed to be a highly rhythmical phenomenon; therefore, an electrocardiogram was selected at random from a number of such records made by Hadley (3), and the intervals between 100 consecutive R waves were measured and translated into hundredths of a second. These intervals were plotted in the same manner as that described above. A representation of chance rhythm was obtained by throwing four dice 200 times and plotting the sum of each throw. The arithmetic mean, standard deviation, and Pearson's coefficient of variation were computed for these data also. Other criteria for comparison was material on the regularity of breathing and brain waves. The former were taken from a study by Fossler (2) in which he measured the duration of inspiration and of expiration for 10 "normal speaking" individuals during rest. The coefficients of variation which he computed were compared with those obtained in the present study. The electroencephelographic data consisted of the means of the number of waves per second for 30 seconds occurring in recorded potentials, taken from the occiput of 10 subjects during rest, and of the standard deviations of these distributions as computed by Scarbrough (4). Pearson's coefficient of variation was computed from these measures to make possible their direct comparison with the other phenomena.

To determine the degree of relationship between mean duration of temporal intervals between moments of stuttering and variability in duration of these intervals, a Pearson product moment coefficient of correlation was run between the means and coefficients of variation for the 20 subjects.

IV. Results

The questions presented in the previous discussion of the problem are answered by the data resulting from this study as follows:

1. The time intervals between successive moments of stuttering tend to be different in length. The measures presented in Tables I and II show that there is definite variation in the size of these intervals for a given individual, more marked in some cases than in others. A comparison of the ranges of the coefficients of variation for various other phenomena with that for the temporal intervals between beginnings of moments of stuttering provides additional proof of the above statement. In Table I the range of the C. V.'s extended from 43.2 to 123.4. For inspirations and expirations during rest breathing the ranges extended from 8.4 to 13.8 and 8.9 to 15.4, respectively. The range of C. V.'s for frequency of occipital action potential waves per second ran from 8.54 to 18.72. The C. V. for the time intervals between successive R waves of the heart was 6.23, and for sums of consecutive dice throws it was 23.35. These figures show that

TABLE I

MEASURES OF CENTRAL TENDENCY AND VARIABILITY IN DURATION OF TEMPORAL INTERVALS BETWEEN BEGINNINGS OF MOMENTS OF STUTTERING FOR EACH OF TWENTY SUBJECTS

Subject	*A. M.*	*S. D.*	*C. V.*	*Range*	*Md.*	Q_1	Q_3
1.	4.2	2.6	63.0	15.2	3.6	2.2	5.4
2.	9.1	10.8	118.6	50.1	4.8	4.2	11.0
3.	8.8	7.8	89.1	34.0	6.8	3.4	11.0
4.	6.5	5.0	77.1	41.8	5.5	2.7	9.1
5.	19.7	15.2	77.2	53.9	14.8	6.8	25.9
6.	3.8	2.4	64.8	14.6	3.3	2.0	4.8
7.	3.7	3.1	83.7	22.4	2.8	1.8	4.3
8.	11.7	9.7	82.7	34.7	8.7	4.4	18.3
9.	6.6	5.0	76.6	30.6	5.3	3.3	8.8
10.	4.9	3.7	76.5	21.0	3.9	2.4	6.4
11.	10.3	11.0	106.7	29.6	7.2	3.7	13.8
12.	3.7	1.6	43.2	9.0	2.8	1.9	4.2
13.	17.8	16.4	91.9	66.5	9.8	6.3	27.1
14.	6.5	5.5	84.1	29.5	5.4	3.2	5.5
15.	4.5	4.0	88.8	26.4	4.0	2.0	5.6
16.	11.2	13.9	123.4	52.6	8.0	4.5	13.4
17.	22.9	23.5	102.5	75.7	12.0	9.8	26.0
18.	22.6	10.1	44.6	38.9	23.2	12.7	28.5
19.	25.3	21.8	86.3	68.7	18.4	7.0	51.0
20.	10.8	9.2	85.1	47.8	8.0	5.4	14.3

TABLE II

MEASURES OF CENTRAL TENDENCY AND VARIABILITY IN DURATION OF FLUENT INTERVALS BETWEEN MOMENTS OF STUTTERING FOR EACH OF TWENTY SUBJECTS

Subject	*A. M.*	*S. D.*	*C. V.*	*Range*	*Md.*	Q_1	Q_3
1.	2.4	1.9	82.6	14.9	1.8	1.2	3.2
2.	8.2	10.8	132.9	49.7	4.3	2.4	10.6
3.	7.9	5.8	73.8	34.1	5.9	2.9	9.6
4.	3.3	2.2	66.7	25.3	2.1	1.1	3.5
5.	18.4	15.6	84.4	53.8	11.6	4.5	25.1
6.	3.0	2.3	81.0	14.4	2.3	1.2	3.9
7.	3.0	3.1	103.4	22.0	2.1	1.2	3.5
8.	10.4	9.1	87.2	35.2	8.2	2.7	14.4
9.	5.4	5.1	93.7	23.2	3.9	2.4	7.5
10.	4.2	3.7	89.4	20.4	3.1	1.6	5.8
11.	9.8	10.4	106.1	30.6	6.6	3.3	13.1
12.	2.3	1.8	78.3	9.0	1.9	1.0	3.2
13.	17.3	13.3	77.3	66.4	9.3	5.9	25.4
14.	3.8	3.1	81.8	16.8	3.1	1.6	5.2
15.	3.6	4.0	110.7	26.4	2.5	1.2	4.2
16.	9.1	13.6	149.6	51.9	5.7	2.6	11.2
17.	22.3	23.3	104.6	75.7	11.5	8.5	24.9
18.	21.2	10.1	47.9	39.2	21.8	11.9	26.1
19.	24.8	21.8	88.0	68.5	21.5	6.0	50.5
20.	9.1	9.4	102.9	45.8	6.3	3.1	10.6

there is greater variability in the length of temporal intervals between moments of stuttering than in the measures of any of the other phenomena considered.

2. The time intervals between successive moments of stuttering do not tend to follow any consistent cyclic pattern.

This is shown in the graphs (Fig. 3), representing the time intervals between successive moments of stuttering and by comparing each of these graphs with the graphs for the dice throws (Fig. 1), and for the time intervals between heart beats (Fig. 2).

The graphs fell into three general types. One typifying each type is presented in Figure 3 and these are marked as Subject 8, 2 and 17 respectively. Figure 1 shows the graphical representation of consecutive intervals between heart beats, and Figure 2 represents the successive sums obtained by throwing four dice. Only the first 100 throws are shown in the plate.

Eleven of the graphs fell into the type represented by subject 8 in Figure 3. They present a pattern similar to that of the random pattern resulting from dice throws. The curves in these eleven are more regular and less extreme than some of the others, indicating relatively more similarity in size of successive intervals, but they are less regular by far than the curve showing intervals between heart beats. The heart beat curve has been superimposed on the graph for subject 8 and has been plotted in tenths of seconds so as to be comparable in size of measuring unit to the intervals between beginnings of moments of stuttering plotted there. The marked difference between the two curves is quite obvious.

Subject 2 in Figure 3 is representative of what was found in three of the graphs. Here a definite trend upward toward the end of the curve is noticed. No definite cyclic pattern is present, except that in these three cases the intervals tended to increase in length as the subject read more and approached the end of the reading passage.

Subject 17 in Figure 3 is typical of the remaining six graphs. Extreme variability occurring sporadically is the main characteristic of this type. It is not unlike the curve resulting from the throwing of the four dice. The resemblance is more readily seen when the respective ranges are taken into consideration.

The above discussion has dealt with the graphs of time intervals between beginnings of moments of stuttering but is equally applicable to the graphs of the fluent intervals—i. e., the intervals between the end of one stuttering and the beginning of the next.

3. Again reference to the measures of variability in Tables I and II shows a marked variation in the size of temporal intervals between moments of stuttering from one individual to another. Comparison of the individual means and medians is also evidence of the differences between individuals in the lengths of time intervals between moments of stuttering.

4. The degree of relationship between mean duration of temporal intervals between beginnings of moments of stuttering and variation in their duration is low as shown by the Pearson product moment coefficient of correlation which was .167+.146.

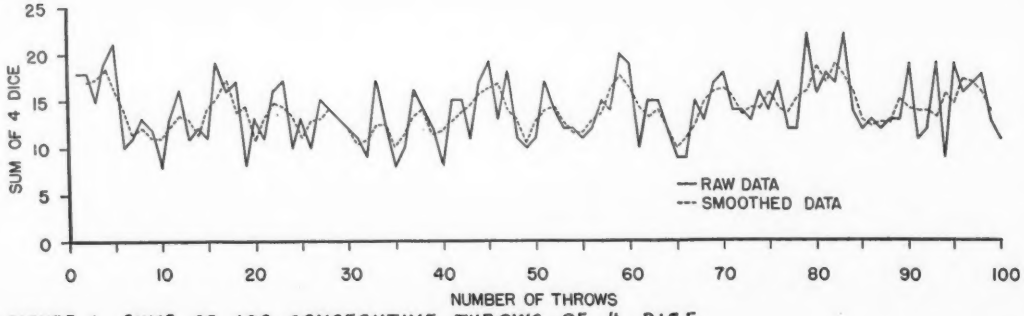

FIGURE 1. SUMS OF 100 CONSECUTIVE THROWS OF 4 DICE

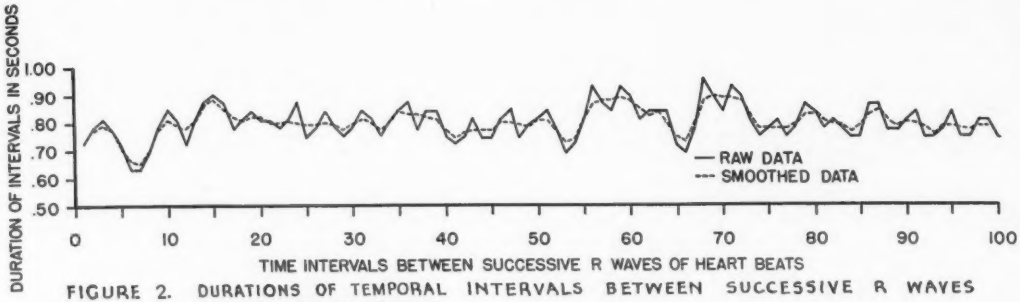

FIGURE 2. DURATIONS OF TEMPORAL INTERVALS BETWEEN SUCCESSIVE R WAVES OF 100 HEART BEATS.

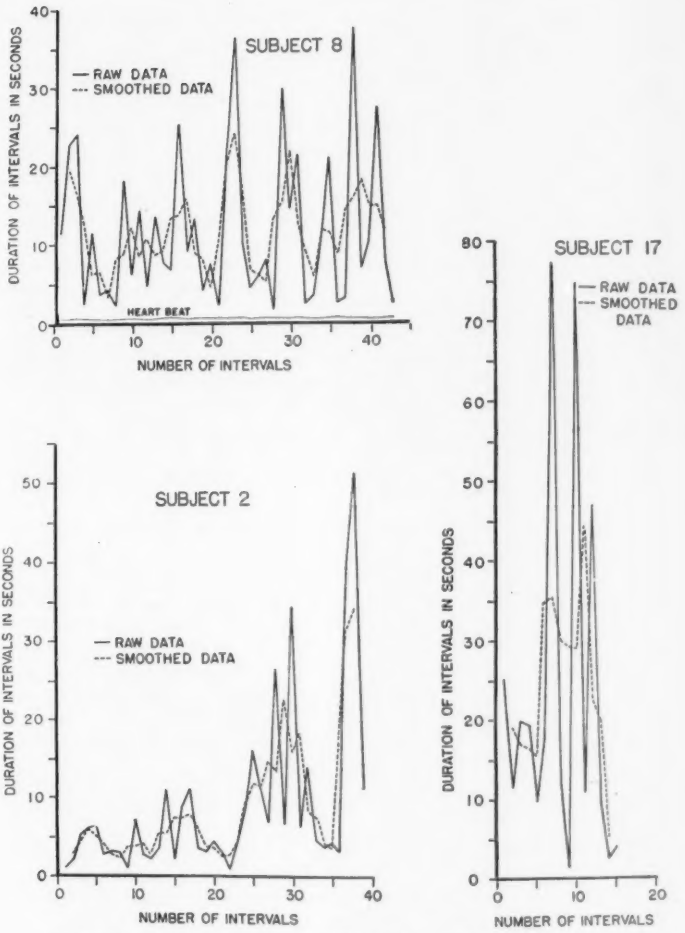

FIGURE 3. DURATIONS OF TEMPORAL INTERVALS BETWEEN SUCCESSIVE BEGINNINGS OF MOMENTS OF STUTTERING FOR SUBJECTS 8, 2, AND 17.

V. Summary

The purpose of this study was to determine whether or not there existed any systematic distribution of the magnitudes of the temporal intervals between successive moments of stuttering, or any cyclic pattern of a temporal nature in the occurrence of stuttered moments.

Twenty subjects, all stutterers, read a one-thousand word passage under the close observation of two unseen observers. The observers pressed individual mercury keys every time the subject stuttered and for the duration of the stutter. This pressure caused two pens on a polygraph to which the keys were attached to deflect from the straight lines they made on a strip of tape running through the machine until the pressure was released from the keys. The distances from the beginning of one deflection to the beginning of the next were measured and translated into seconds.

The analysis of the data revealed the following results:

1. The temporal intervals between successive moments of stuttering vary markedly in size for a given individual. This is true for all the individuals studied.
2. The temporal intervals between successive moments of stuttering do not occur in any sort of cyclic pattern, except that in some instances they tend to grow longer as the subject reads more.
3. The degree of variation in size of temporal intervals between successive moments of stuttering and the mean extent of these intervals vary from individual to individual.
4. The relationship between mean duration of temporal intervals between successive moments of stuttering and variability in the duration of these intervals is negligible.

Compared to such measures as the size of temporal intervals between successive beats of the heart, length of inspirations and expirations of breathing cycles, and frequency of waves per second recorded from the occiput (all three of these measures taken during rest), the time intervals between successive moments of stuttering show much greater variability. The C. V.'s for all the stutterers were considerably larger than the C. V. for 200 consecutive dice throws.

Within this relatively large range of variability there is apparently no tendency for the successive moments of stuttering to occur in any sort of cyclic pattern, such as occurring closer and closer together or farther and farther apart with any sort of marked regularity, or with every eighth interval being especially long, etc., except that in some instances there is a tendency for them to occur farther and farther apart as the individual continues to read over a period of time. The size of these intervals, as they occur successively, varies generally in a "random" manner, the curve representing them tending to resemble a curve of sums of successive dice throws, and being generally more irregular than a curve representing intervals between successive heart beats.

VI. Discussion

There are two results of the present study that are of special interest. In the first place, it has been shown that there is a marked variability in the size of temporal intervals between successive moments of stuttering both from one individual to another and for a single individual, the variability being more marked in some cases than in others. In the second place, it has been demonstrated that the *successive* time intervals between moments of stuttering do not show any consistent regularity in length, nor do they occur in any sort of marked cyclic pattern. Had the reverse been the case, it might have been assumed that, since stuttering occurred with marked regularity or followed a highly consistent pattern, it arose from some organic condition, because such basic physiological phenomena as heart beats, inspirations and expirations of the breathing cycle, cortical action potentials, and others do occur with a relatively high degree of regularity. It would be still more to the point in formulating such an assumption to refer to abnormal, non-universal conditions such as the tremor of intention, which has its origin often in some organic disturbance and which occurs with definite regularity. Since stuttering does not occur with any such regularity, it is safe to say that either it is "functional" in origin or that it arises out of some organic condition which does not produce regularly occurring phenomena. Other studies have demonstrated that stuttering seems to be a response of a "functional" type.[2] The present study may be looked upon as corroborating these findings since it shows that stuttering is not markedly systematic or regular in occurrence but is relatively variable; the variability shown would appear to be more indicative of psychological or semantic determining factors than of relatively constant biological, or constitutional, or organic determining factors.

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[2]See especially the studies in the Psychology of Stuttering published in previous issues of the Journal of Speech Disorders.

BIBLIOGRAPHY

(1) **Colley, William E.** Relation of frequency to duration of moments of stuttering, M. A. Thesis, State University of Iowa, June, 1939, (unpublished).

(2) **Fossler, Harold Ray.** Disturbances in breathing during stuttering, *Psychological Monographs*, 1930, 40, 1–32.

(3) **Hadley, John M.** Relationship between electrical signs of cortical and peripheral activity, Ph. D. Thesis, State University of Iowa, August, 1939 (unpublished).

(4) **Scarbrough, Hartwell E.** A qualitative and quantitative analysis of the electroencephelogram in stutterers and non-stutterers, Ph. D. Thesis, State Universitv of Iowa, August, 1939 (unpublished).

BOOK REVIEW

THE VOICE, ITS PRODUCTION AND REPRODUCTION. By Douglas Stanley and J. P. Maxfield. Pitman Publishing Co., New York, 262 pp., 32 illus. and figs. $2.50.

Owing to the recent appearance of a new edition of another book by Stanley, request has been made for a review of the one herein considered.

I find nothing in Maxfield's contribution which can be seriously questioned. It only covers 32 pages, but it is undoubtedly the best part of the book. His is confined to a hurried summary of some of the more recently ascertained facts of physics, as they pertain to the human voice. He gives a very simple and readily understood explanation of many terms such as decibel, reverberation, vibrato, etc., which every voice teacher will appreciate as an aid to their more intelligent use.

Stanley's statement indicating the damage done to the field of voice by the so-called radio teachers is not overemphasized. His discussion of the use of the English language in singing, with his suggestion that the elisions be reduced to the minimum, making the technic much more that of the Latin language with consequently a true legato, is well put. His statement that prolongation of the phonated part of resonated consonants would certainly lead to poor intelligibility, is one I wish every choral conductor, as well as singer, would read and understand. I like, also, his explanations of the true meaning of "relaxation," making all realize that this so-called "relaxation," or better, "freedom," is not collapse, but the tensing of the correct set of muscles rather than the incorrect set.

He brings out very nicely the truism, which is all too often lost sight of, that the mental concept of the tone and the phrase, and in fact vowel, emotional quality and intensity is the basis upon which rests all the reflex co-ordinations of the muscles.

I believe that his use of the word "intensity" should be defined a little better in this work, so that there will be no question left in one's mind as to his exact meaning when he says that in ascending the scale the intensity must be gradually increased.

His knowledge of the physiology of the singing voice often leaves us bewildered. Just what does he mean for example, when he says: "If the concept is clearly defined and no inhibition is present, and if the mouth cavity is shaped against the mouth vowel position, it must follow that the extensor muscles of the laryngeal pharynx will come into tension." Does it, follow? Would any competent physiologist, laryngologist or phonetician, say that was a scientific statement? A large number of such quotations could be cited to show how often he falls into the same unscientific error he charges to others.

Stanley is probably correct in stating that vocal teachers and singers manifest confusion of ideas as to the nature of sound. But I also believe that most acousticians know very little of voice as

(*Continued on page 356*)

THE X FAMILY: A CLINICAL AND LABORATORY STUDY OF A "STUTTERING" FAMILY[1]

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A tendency for stuttering to "run in families" has been reported by a number of investigators. The present study differs from previous investigations in that it is concerned with a single "stuttering family." There are two main branches of the living members of the family, the one being located in Iowa, the other in Kansas. A limited amount of information has been obtained concerning the Kansas branch. The Iowa branch has been studied in considerable detail. It is comprised of eight stutterers, three former stutterers, and sixteen non-stutterers. The Kansas branch is comprised of one stutterer and sixteen non-stutterers. Information concerning the members of five generations has been collected.

The study was designed to answer questions regarding the distribution of stuttering within the family, the definite similarities or differences among the stutterers, former stutterers, and non-stutterers, and the nature of the evaluations or assumptions expressed by members of the family regarding stuttering.

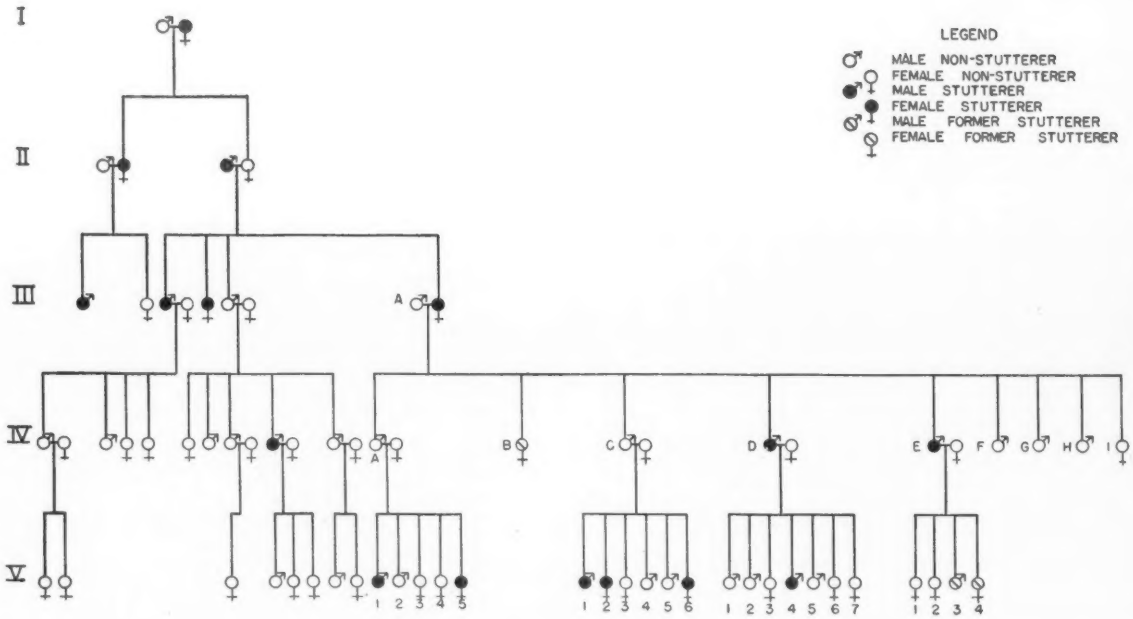
Information concerning the Kansas branch of the family was obtained in the course of interviews with members of the Iowa branch and by correspondence with members of the family who live in Kansas.

Case histories were taken of the twenty-seven living members of the Iowa branch of the family. Tests of laterality, intelligence and silent reading were administered to all individuals and the Bell Adjustment Inventory was filled out by members of the family over thirteen years of age. Stutterers were checked for observable stuttering phenomena and each phenomenon in twenty-five stutterings was recorded.

The distribution of stuttering throughout the family is shown in Figure 1. Detailed information is not available on generations I and II. It is to be noted that the stutterer in the I generation was a female. One of her daughters married a stutterer and from this union came the three stutterers in the III generation, two females and one male. The earliest known ancestor about whom we have been able to secure detailed information is III A. She is the mother of IV A, B, C, D, and E. She remained in Iowa and her three siblings went to Kansas. One brother of III A stuttered, and his four children and two grandchildren have "normal" speech. Another brother had "normal" speech, but one of his five children stuttered. This child did not marry. The six descendants of his siblings have "normal" speech. III A had one sister who stuttered but we have

[1]This study was done at the University of Iowa under the direction of Wendell Johnson.

FIGURE 1


I
II
III
IV
V
A
B
C
D
E
F
G
H
I
LEGEND
MALE NON-STUTTERER
FEMALE NON-STUTTERER
MALE STUTTERER
FEMALE STUTTERER
MALE FORMER STUTTERER
FEMALE FORMER STUTTERER
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4

no further information regarding her. Thus, there is but one stutterer among the IV and V Kansas generations.

Figure 1 shows the positions of the eight stutterers and three former stutterers in the IV and V Iowa generations.

Approximately 40 per cent of the members in the IV and V generations of the Iowa branch of the X family stutter or have stuttered. On the other hand, there are seventeen living members of the Kansas branch of the family and only one of them stutters.

The data summarized in Figure 1 suggest two main questions: (a) Why are there so many stutterers in the Iowa branch of this family? (b) Why is there such a marked difference as to incidence of stuttering between the Iowa and Kansas branches?

An attempt to answer the one question directly and the other indirectly can be made by examining the data for the Iowa members of the family. Space does not permit a detailed presentation of these data.[2] They may be summarized, however, by saying that they indicate that apparently the only suggestive differences found between the stutterers, non-stutterers and former stutterers were possibly in the birth conditions, speech development histories, "nervous" habits and personality inventory scores. Other aspects of the case history data, as well as the measures of laterality, intelligence, and reading ability, did not reveal any definite group differences.

V A1, a stutterer, was born four weeks prematurely, but with normal delivery, and V C2, a stutterer, weighed four pounds at birth. Difficulty was experienced in initiating breathing in the latter case. Birth conditions of the non-stutterers, former stutterers, and the remaining six stutterers were apparently normal. The evidence obtained seemed to indicate that perhaps there was a somewhat later development of speech, on the average, among the stutterers and former stutterers, but the group differences were not definite enough to suggest that the factor of speech retardation was clearly related to the stuttering. In regard to "nervous" habits, two of the sixteen non-stutterers showed some form of "nervous" behavior, while such behavior was reported in one form or another for five of the eight stutterers. The "nervous" reactions may be regarded as being to an indeterminable degree the consequences, rather than the causes, of the speech difficulties; consequently, their relation to the stuttering is difficult to appraise. The adjustment inventory scores represented the non-stutterers as being generally a little better adjusted than the other two groups, but again the extent of group overlapping and the circularity of the relation in which the indicated degrees of "adjustment" stand to the stuttering makes any group differences in this connection appear to be of indefinite significance so far as any possible cause and effect relations are concerned.

It seems reasonable to doubt that a sheer hereditarian hypothesis would account readily for the difference in incidence of stuttering

[2]A thorough description of the investigative procedures and detailed statements of findings are to be found in the manuscript copy of this report on file in the University of Iowa Library.

between the Iowa and Kansas branches of the family, or for the relative lack of definite developmental, physiological, and behaviorial differences between the non-stutterers, stutterers, and former stutterers in the Iowa group. And there is another finding that would seem, from some points of view, to present difficulties of interpretation from a strictly hereditarian standpoint: The ratio of male to female stutterers in this family is markedly in disagreement with the ratios reported in other studies. The ratios most frequently reported range from 3 to 1 to 5 to 1. In contrast to these ratios, stuttering is divided practically evenly between the sexes in the X family. Counting both stutterers and former stutterers in the Iowa group there are 6 males and 5 females; if the living Kansas stutterer is included, the ratio for the whole family is 7 to 5 in favor of the males. If the deceased stutterers are included the ratio is 10 to 9 in favor of the males; excluding one stutterer who came into the family in the II generation by marriage, this ratio becomes 9 to 9. This *could* happen on a purely biological basis, but it does not seem very probable, if one assumes that the sex ratios previously reported for stutterers generally rest on a biological basis. If one does not assume this—and it is not necessary to do so, of course—the question of interpretation is quite open. Any hypothesis involving factors of health and disease, laterality organization, general development, etc., would hardly appear to be unquestionably tenable as far as the X family is concerned.

Another approach toward an interpretation of the findings of this study can be suggested. The stuttering in this family might be regarded as semantogenic—that is, as arising out of a semantic environment involving attitudes, evaluations, neurolinguistic patterns, policies, etc., particularly conducive to (a) the diagnosis of more or less normal speech phenomena as stuttering, and (b) the anxious, strained, hesitant speech behavior which the diagnosed individuals tend to develop. Briefly, this family might with some reason be regarded as "stuttering conscious," quick to diagnose as stuttering the hesitant, repetitious first speech attempts of children learning to talk, and prone to develop in the child the familial anxieties and generally negative evaluations regarding hesitant or repetitious speech.

Eight of the eleven stutterers and former stutterers in the Iowa group were regarded by their families as stutterers as soon as they began to speak, and one of the other three apparently diagnosed herself as a stutterer after imitating the speech of her stutterihg brother. Moreover, the phenomena diagnosed as stuttering in the speech of these children at the time they began to speak, while not clearly recalled by the informants, was believed to have been in the nature of repetitions for the most part and not as "severe" as the later difficulties. Too, practically every informant expressed the belief that stuttering was hereditary in the family. All of this raises the definite question as to whether possibly anxiously expectant parents and relatives rather precipitously looked upon more or less normal beginning speech reactions as stuttering. It is of interest

that if the eight cases diagnosed at beginning of speech could be accounted for on such a basis, there would be scarcely anything about this family that would be remarkably noteworthy so far as speech is concerned. As it is, the Kansas branch of the family presents no particular theoretical problem, except that if the stuttering in the Iowa branch is assumed to be hereditary, the comparative lack of the disorder in the Kansas group may present difficulties of interpretation to other than rather extreme hereditarians—especially since three of the four members of the third generation, two of whom stuttered and all of whom were descendants of stutterers, went to Kansas and only one remained in Iowa. If this had been reversed—i. e., if three of the four had remained in Iowa—a strictly hereditary interpretation of the difference between the two branches of the family would be at least less untenable.

Thus, one can hardly separate this question of the difference between the two branches from the question raised by the unusually high incidence of stuttering within the Iowa branch itself. If the one cannot be clearly answered on the basis of sheer heredity, it is hardly logical to answer the other on that basis, either. And it seems necessary to conclude that there is "reasonable doubt" of the validity of an hereditarian interpretation with regard to either question considered by itself.

It remains to be considered whether the semantogenic hypothesis can serve to account for the relative lack of stuttering in the Kansas branch of the family, while accounting—insofar as it does—for the high incidence of it in the Iowa branch. One can only say that those who went to Kansas severed their contact with the Iowa group to a relatively high degree. The two most recent generations (IV and V) in Kansas have had practically no personal relations with their Iowa relatives. The point of this is that one would hardly expect the semantic environment which the Iowa group developed for itself to have had any appreciable influence on the Kansas group, except as the three who originally went to Kansas shared and later maintained and elaborated any pertinent attitudes and evaluative tendencies which characterized their Iowa sibling. Whether they did or not one cannot be sure, but it is pertinent in this connection that the one individual who seems to have had most to do with "setting the semantic tone" of the Iowa IV and V generations was not the sibling of the III generation who stayed in Iowa, but one of her sons, IV E, with whom the Kansans have had no significant contact. He was repeatedly referred to by the other members of the family in such phrases as "we wondered whether our children would stutter like IV E," or "I couldn't stand it if I talked like IV E." The family notions about stuttering and their attitudes toward it seem to have stemmed from him to a marked degree, both by virtue of his relatively severe stuttering and of his comparatively dominant position within the entire family group. The fact that his influence has hardly been felt in Kansas would, in itself, indicate that the semantic environments of the two groups probably have been different.

There is the further question as to why, under the semantic conditions which obtained for the Iowa group, some or most—perhaps even all—of the non-stutterers escaped being diagnosed as stutterers. An adequate answer to this question is scarcely possible. A similar question is raised, of course, in a consideration of most families from various other points of view. Why are some, but not other, children of a given family regarded by their parents or relatives as "stubborn," or "bad," or "gifted" along musical or artistic lines, or "cut out for the ministry," or "dependable," etc.? It is certainly not always because the parents and relatives have made adequate factual investigations before arriving at such judgments. The question is frequently puzzling, and perhaps no more puzzling in the present instance than in others. This does not constitute an answer to the question so far as the X family is concerned, but it does make the lack of an adequate answer more comprehensible.

It is particularly interesting that some of the non-stutterers were reported to have had early or beginning speech that was "non-fluent." One might wonder especially why these were not diagnosed as stutterers. But aside from this question, it is to be noted that the family inadvertently carried out an unusually interesting experiment. There were certain members of the family whose beginning speech was regarded as "non-fluent," and some of these were diagnosed as stutterers, while some were not. The ones not diagnosed as stutterers during their "non-fluent" stage of development were later and are now regarded as non-stutterers, while those who were diagnosed as stutterers developed more severe non-fluency. Also, other members of the family were reported to have had early speech that was fluent. Some of them were not diagnosed as stutterers and these remained fluent. Some, however, came to be regarded as stutterers, and these developed definite non-fluency, particularly after being diagnosed. These facts are suggestive of an extremely important study that might be designed to investigate the possibility of the experimental production of stuttering—i. e., of relatively severe non-fluency, apprehensive, strained speech, and related phenomena. The study might be patterned in part after this experiment which the X family seems to have unwittingly carried out, and if the difficulties that might be expected to arise in obtaining subjects could be overcome, the findings should be of considerable significance.

The sex ratio among the stutterers and former stutterers in the X family does not seem to present any obvious difficulties of interpretation on the basis of the semantogenic hypothesis.

It is quite apparent that conclusive answers cannot be given to the two questions previously stated. The difficulty of clearly establishing the semantogenic interpretation is perhaps not quite as definite as are the questions which a strictly biological explanation would appear to leave unanswered. The semantogenic hypothesis would seem, also, to have the more hopeful and practicable remedial implications, and to suggest more possibilities for further investigation of the issues raised by the findings of this study.

PROBLEMS OF POLICY—THE EDUCATION OF TEACHERS

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Problems of policy confront any living, growing organization. We are concerned, therefore, not about the existence of problems but rather about their judicious solution. Although we frequently do not agree upon what would be the wisest course to follow, yet we share the desire to build this profession and share too the conviction that unity of purpose is essential for its growth. But unity of purpose does not just happen; it comes as a result of mutual effort to understand one another and to think through our problems reasonably and intelligently.

Two factors hinder our understanding of each other. One is the diversity of educational background. Some of us came into the field by way of public speaking, others from psychology, medicine, physics, drama, or from elementary school education. Moreover, our graduate study in this field has not yet reached a desirable degree of standardization. While this diversity of background will tend to decrease as a more specific body of knowledge is organized and as professional standards become more nearly uniform, nevertheless its existence today should be recognized as one of the reasons for our differing opinions and points of view. The second factor is our diversity of professional interest. Some of us are interested chiefly in research, some in the education of graduate students who will soon become specialists, others chiefly in clinical practice, and still others in the education of teachers. It is right and necessary for such specialization to exist. Nevertheless, as members of an organization whose function is to serve the whole profession, we must resolve to obtain a clearer knowledge and deeper appreciation of all aspects of the field.

One factor sometimes hinders our thinking. It is the failure to distinguish between basic and superficial relationships. For example, we are troubled at times because our young profession lacks prestige, justifiably troubled too when we see that that lack delays the achievement of worthy purposes. Yet were we to concentrate our efforts on the building of prestige we would be pursuing a false goal since it can come to the profession only as the good work of its members gains wider recognition. The basic goal is rather one of improving the quality of our membership and of extending our valuable services. Or again, as we view with dissatisfaction the amount and quality of our productive research, we may see only a relationship between that fact and the personnel of our convention audiences. When we analyze the situation more carefully, however, it becomes more apparent that the fundamental need is for the Association to set up and encourage a broader program for research

and at the same time attempt to make available more time and money for such expansion. Similarly too, we need to distinguish clearly between the superficial and basic aspects of the problem of educating teachers in the principles of speech rehabilitation. We read and we hear arguments both pro and con on this subject: teachers should be so trained, they need not be; teachers are valuable aides in the corrective program, they really do very little; teachers with but little clinical experience can correct minor speech defects, they do more harm than good; a trained teaching personnel will help to create more clinics, the specialist would tend to disappear under such a program. The need for clarification is evident.

It is the purpose of this article in presenting a discussion of policy regarding the education of teachers, not to utter a final opinion, but rather to offer the subject for further thought and discussion with the hope that we as an association may subsequently agree upon a corporate statement of policy.[1] It might also be suggestive as an orderly procedure for studying other problems facing our group.

I. A Working Affiliation with Public Schools

While the pathology of speech is a scientific problem, the rehabilitation of speech is an educational problem. Now without denying in any way the value of private clinics, we should then consider the proposition of a working affiliation with the nation's schools. Inasmuch as we are attempting here to develop a philosophy upon which to base present and future policy, let us rule out factors of precedent or expediency on either side. Thus the fact that we are already in many instances working through the public schools is no reason for continuing to do so or for hoping to extend this service; nor are such subjects as placement for clinicians, financial return, or prestige of the profession worthy arguments either for or against the proposition. As we begin our reasoning, it would seem that the basic premise must be that conviction which led to the establishment of this profession, namely, that *speech defects should be and can be removed.* Before any conclusions can be drawn as to the most effective means of fulfilling our purpose, we must review several facts.

1. Although surveys have shown various figures to represent the number of individuals with defective speech in this country, we can all agree that there are at least several millions so handicapped. If our confessed task is to help these persons, then we must find the best means of reaching them. University and college clinics as well as private clinics are making a very worthy contribution, but their facilities are not and cannot be readily available to the majority of these people who want or need help. The obstacles are both geographical and financial. The free clinics at colleges and universities cannot even eliminate these obstacles since their geographical distri-

[1]Apropos of the fact already mentioned of our present diversity of educational background and professional interest and experience, it is fair to state the author's bias in this respect. She came into this field by way of public speaking; graduate work emphasized anatomy, physiology, and neurology; experience has included clinical and supervisory work in the public schools; special interest is the education of teachers.

bution prohibits ready access for people who can ill afford to make the necessary trips or to take up residence for the time required for remedial treatment.

2. We are agreed that speech defects can best be and should be removed in childhood. Many are not, however, as every clinician knows. The principal reasons for such delay are the fact that clinics are not available in the community and the further fact that parents and teachers are not aware of the need for corrective measures.

3. We have a contribution to make to public education, one which many administrators and teachers appreciate as much as we do. They know that speech is as important at least, as the other language arts, that normal speech is a desirable pre-requisite for learning to read, for scholastic achievement, for social adjustment, and in fact for fulfilling all the purposes of education. In view of the number of children who are handicapped by defective speech, this relationship of speech rehabilitation to the school program is significant.

4. The public schools have a contribution to make to speech rehabilitation. Examination and diagnosis of speech cases is not enough, and therapy does not consist of so simple a procedure as prescribing certain pills or exercise to be taken night and morning. We know that the process of re-education in most cases is not only time consuming but complex. Any clinician who has worked with a child for a period of time and then must turn him back to his community, his parents, and his teachers, knows the discouragement of trying to make recommendations for further treatment at the hands of totally untrained persons. There is evident need of intelligent collaboration throughout the whole program in respect to actual remedial work, motivation, and socialization, whether the clinic be located fifty miles away or whether it be right in a given community.

These four aspects[2] of the situation support the conclusion that a working affiliation with the public schools is desirable and that the present degree of our affiliation should be extended. This extension should proceed in three directions. First, adequately equipped and expertly staffed clinics should be made easily available to every school for diagnosis and consultation. Although this expansion is already taking place, our national society might well undertake to direct systematic plans for reaching this goal. In states such as Pennsylvania, in which the universities, teachers colleges, and liberal arts colleges are so distributed that no school is far away from at least one, clinical centers could be located at these places. Remote districts in other states could be served by county clinics. City schools should be able to, and no doubt would prefer to, establish their own clinics. Second, certain qualified students should be allowed and encouraged to pursue an undergraduate minor in speech

[2]It has not seemed necessary to support these statements by means of case studies since this article is directed to colleagues, who can verify the points from their own clinical experience.

correction in addition to their elementary or secondary curriculum. They can then, as teachers, establish and carry on a part time program of rehabilitation in schools that either have not previously seen the need of instituting corrective work or could never afford a full time clinician. Although such teachers will need the help of the clinical center for problems of diagnosis, yet they will be able to administer the remedial treatment rather independently. Third, every prospective teacher in the elementary grades should be required to take one course in speech correction. If such a course is set up and administered specifically for the classroom teacher, she should then be able to make an effective contribution under supervision.

II. Prevention of Dangers in Such a Program

The author has been deeply interested in the education of classroom teachers as a means of meeting the need for extended clinical service, and has been convinced through experience in working with such teachers in the public schools that those with some training are making a worthy contribution. She has therefore followed with keen interest the previous written and oral discussions of this problem, especially the arguments of those colleagues who have been opposed to as close an affiliation with the schools as has been herein suggested. These objections are sincere and reasonable. They do not constitute, in her opinion, a refutation of the conclusions reached above, and perhaps have not been so intended. They do, however, serve as a warning of the dangers which can or do exist in the program of teacher education, and as such are a worthy contribution to our thinking. It is wise, then, to point out these dangers and to suggest ways of removing them from a potentially desirable program.

1. *The danger of over-simplification* lurks near any attempt to educate the layman, and the teacher who is to take but one course in speech correction is essentially a layman in respect to this field. Our zeal to extend aid to the handicapped is a desirable trait, but if it takes the form of merely listing a few recipes or methods for the removal of symptoms then we are guilty of the same type of quackery that we abhor, for instance, in those who engage in the wholesale traffic of patent medicines. And even though we keep our personal standards of clinical service high, nevertheless by such teaching we would be guilty of sending teachers quite innocently down that road. At the other extreme we might make a serious mistake too. If in the effort to show our students the really complicated nature of speech disorders we teach nothing but theory, then the lack of practical knowledge still leaves them unable to offer any real contribution to the rehabilitation of children's speech. The answer obviously lies in a judicious choice of subject matter for such a course.

As a matter of fact the greatest danger of over-simplification lies already in the minds of laymen, as shown by their tendency to explain away articulatory disorders as mere "baby talk," and stuttering with the remark that "he just thinks faster than he speaks." So even at our worst, perhaps we are combatting the problem; at our best we have the opportunity to replace ignorance with knowledge.

2. *The danger of over-selling our case* is another temptation to which the crusader in us may quite innocently yield. This tendency has been manifest upon certain occasions in the form of excessive popularity of speech correction with accompanying neglect of the other phases of speech education. Such a condition is unfortunate in several respects. It has for one thing forced a number of persons in the field of speech to engage in clinical activities when they had neither adequate training nor special interests in that work, solely because speech correction seemed to them or to their school officials to be "the latest trend in speech education." Moreover, it has in some cases acquired the characteristics of a fad, and when the pendulum of public opinion swings to the other extreme, our cause will surely suffer. Finally, it is unfortunate because our lasting strength will come from union with and not divorce from other phases of speech education.

Another evidence of "over-selling" has been manifest in at least one city. The superintendent became so completely convinced that elementary teachers could carry on the corrective work that he looked upon his special teachers as superfluous. Instead of working to increase the number of such special teachers, a thing badly needed, he became actually antagonistic to them and their program.

Our reasons for believing in the education of the classroom teacher are sound. They need not be bolstered by over-optimistic propaganda which is bound to produce such unfortunate results.

3. *The danger of the classroom teacher assuming the role of specialist* is the third main objection. As a matter of fact, when one considers the subject carefully, it is safe to say that as much, if not more, actual harm has been and is done by well meaning people without any speech training as is done by teachers who because they have had one course might assume that they know the whole field.

However, we should not dispose of so grave a possibility too lightly. Granted that some teachers do presume too much upon a meager clinical background, let us analyze the cause of such action. If it be true that "a little knowledge is a dangerous thing," then we might well conclude that therefore classroom teachers should receive no clinical education. Two other causes seem more logical. One is the fact that their clinical training has been faulty. Unless the course for teachers is especially designed to fit them for a particular role in the corrective program, their knowledge of that role will be vague, and they cannot therefore be blamed for violating professional ethics. The second cause is the fact that clinical centers are not yet conveniently enough located to encourage or make possible frequent consultation. Students may learn in class that they must work under supervision, but unless such supervision is available a teacher cannot be criticized too severely because she sees a need and tries to meet it as best she can under the circumstances.

4. *The professional status* of the classroom teacher is another factor, though less fundamental. The question involves the point of whether these teachers should be considered as "speech correction-

ists" and therefore be permitted to enter our professional organization. Certainly such a conclusion need not follow as a corollary of the decision to extend clinical instruction to prospective teachers. Possibly, however, the policy of the newly organized Pennsylvania Speech Association suggests a helpful answer. Since its function is to solve problems and to promote speech education in the state, this body felt that it would like to and should welcome to membership *anyone* who is engaged in or interested in such problems. This policy may well prove to be a desirable way of co-operating with and educating such teachers, and at the same time satisfy a desire on their part for affiliation with a speech group. Our national organization could then feel quite relieved of any conscience pangs in limiting its membership to highly trained specialists in the field, who would assume responsibility for making it the professional and scholarly body that it should rightly be.

III. Type of Education

If it is right that we educate the classroom teacher, then we must have clearly in mind what that education should consist of for undergraduate students.

1. One course dealing with speech problems among children should be developed specifically for students pursuing the elementary school curriculum. The objectives and choice of subject matter should be based upon the role that the classroom teacher can safely and yet effectively play in the corrective program. It is therefore necessary to be explicit in the statement of that role.

(a) She should be able to distinguish between normal and defective speech, i. e., she should be speech conscious, should have a well trained ear, should be familiar with norms for various age levels, should be able to report accurately upon the degree of progress which the clinical patient shows in the classroom.

(b) She should have a sound knowledge of the complexity of the speech process, i. e., she should know that many speech defects are not readily outgrown, that they cannot all be tossed aside with the label "baby talk," that frequently defective speech is the first sign of progressive hearing loss, that lisping is not cured by "clipping the tongue," that the various tricks often employed will not cure stuttering, etc.

(c) She should be well enough acquainted with the techniques of rehabilitation, especially those of socialization and motivation, to be able to talk and plan intelligently with the specialist about her part in the remedial program. For example, if the specialist advises more relief from nervous tension, she will be able to discuss possible adjustments that can be made in the school routine, instead of just listening to his suggestions, which at best can be only suggestive, and not inclusive.

If the teacher is located in a school that does not have a resident specialist in speech, her role will need to be somewhat more extensive.

(d) She will need to know which cases she may safely work with and which ones must have the advice of a specialist. Specifically, she must arrange for consultation for stutterers, voice cases, possible hearing deficiency cases, as well as children suffering from marked delayed speech, paralysis, or cleft palate. She may, of course, work with these cases under supervision. She may undertake remedial treatment for the uncomplicated articulatory cases.

(e) She should, finally, know the fundamentals of getting a case history, so that information may accompany the child to the clinical center or be forwarded in advance, as preferred. Such a service can be of real help to the specialist in diagnosis and prescription of therapy.

2. A carefully planned sequence of courses should be available for the few students who show special aptitude from the point of view of personality and scholarship. Their clinical education should be based upon their future role in the corrective program. Three factors should therefore be considered. First of all, they are the ones who will go into school systems unable to afford a full time resident specialist. Hence they must be qualified to work rather more independently of the clinical center. Second, they are the ones who, pursuing corrective work in addition to the regular classroom teaching, will create the half time and full time positions in their school systems. Hence they must be not only skillful clinicials but also convincing advocates of speech rehabilitation. Finally, they are the ones who will probably pursue graduate work in this field and eventually join our professional ranks.

The author has arrived at several convictions regarding the education of these students.

(a) They should minor, not major, in speech at the undergraduate level. The nature of speech activity itself demands a liberal background of literature, social science, and philosophy; the nature of clinical work demands a background of science, psychology, and education. It seems wise therefore for students to obtain this diverse knowledge while they are undergraduates so that they will be more mature and better prepared to specialize during their post graduate education.

(b) They should pursue the elementary curriculum in addition to the study of speech. Because speech disorders are primarily problems of childhood, students should study children, their whole development and problems. Because speech rehabilitation is an educational problem, they should also study thoroughly the education of children. Morever, there is an advantage for prospective clinicians to have had at least one year of experience as classroom teachers, so that they know first hand the routine and the problems of the school life into which they must fit their program of special education. Finally, certification in the field of elementary education offers financial security for students who are seeking their first jobs. Many schools, indeed many colleges, will not hire an inexperienced

teacher even in the field of special education. In addition, the market for full-time speech teachers is at present inadequately developed. If, however, college graduates in clinical speech are able to teach in the elementary grades, they have a chance to gain the necessary experience and at the same time to build up a clinical program which will create a full-time position in the future.

(c) They should have a thorough background in the whole field of speech. After all, we are interested in the rehabilitation of speech because we believe in the importance not only of normal but also of effective speech. While it is right that some of us should specialize in speech disorders, nevertheless, we will be wise to remember our relationship to the rest of the field. The mention of two aspects of this relationship should be suggestive: a knowledge of the normal in order to better understand the abnormal, and a familiarity with the pedagogical principles of speaking, reading, drama, and voice and diction—which are as applicable to speech re-education as to speech education.

Conclusion

By way of conclusion, one might be forgiven for indulging in a single speculation. As we recall that our own education in this field began for the most part in graduate school, we cannot help but be aware of the possibilities for the graduate education of these students who have a thorough undergraduate background in clinical speech. And as we recall too that most of our graduate credits were earned in some department other than Speech, we must indeed feel the challenge for working out a more advanced type of graduate study for them than was possible at that time for our instructors to provide for us. Thus as we consider not only what these teachers will do but also what they may become, we are face to face with the fact that the various problems in our field are related. It behooves us therefore—whether our special interest is in research, or the education of graduate students, or clinical practice, or the education of teachers—to offer our best efforts in determining what our professional policies should be.

BOOK REVIEW

(Continued from page 342)

sound. Yet his explosion of the "vocalized breathing" myth is very well put.

It might also be in the nature of criticism to state that not only is the naso-pharynx not adjustable, but it is above, and not behind the soft palate. He speaks of the boundaries of the mouth in resonation. Boundaries, it seems, should be walls, not areas, which are intercommunicable if no walled obstruction interposes. The vocal cavities make up a coupled system and cannot be isolated in parts during phonation. This latter criticism covers pages 74 to 77.

(Continued on page 384)

THE ORGANIZATION AND GUIDING PRINCIPLES OF THE NEW YORK CITY SURVEY OF THE SPEECH HANDICAPPED CHILD CONDUCTED OCT. 1939—JUNE 1940

JAMES F. BENDER, Ph. D.,
Queens College

Importance of Surveys:

Surveys of the speech handicapped child in the United States have been carried on from 1893, when Hartwell surveyed the problem of stutterers in the Boston public schools, to the present time. They have been invaluable in indicating to educators, administrators, specialists and the public the ubiquity of the speech handicapped child. Some of the more important speech surveys that have been made, together with pertinent data, are presented in the following table:

Date	*Place*	*Persons in Charge*	*Numbers Speech Handicapped*
1893	Boston, Massachusetts	Hartwell	.78% (stutterers)
1904	Six American Cities[1]	Conradi	2.46% (speech defectives)
1911	New York City	Reigart	2 %
1911	Principal Italian cities		25 %
1916	St. Louis, Missouri	Wallin	2.8 %
1921	Milwaukee, Grand Rapids	Blanton/Camp	2.64% (stutterers)
1926	South Dakota	Root	8600 (speech defectives)
1929	Oregon	Wells	16320
1931	Countrywide	White House Conference	5% (between ages 5–18)
1932	Tasmania State Schools	Parker	2371
1938	Des Moines Public Schools	Kolp	291
1939	Illinois High Schools	Carhart	20.8% (estimated)
	Mancato, Minnesota, Grade Schools	Zimes	17%

[1]Kansas City, Missouri; Milwaukee, Wisconsin; Cleveland, Ohio, Louisville, Kentucky; Albany, New York; Springfield, Massachusetts.

These, then, constitute a cross-section of speech surveys made up to the present time. Many of these surveys have served a useful purpose in that they have indicated clearly to administrators and taxpayers the need for speech correction. Most of them have been conducted under conditions far from ideal. Most of them made use of the questionnaire addressed to the class-room teacher, asking her to list the various types of speech handicapped children in her class. This technique is an admittedly weak instrument for discov-

ering the facts about the speech handicapped child. It has, no doubt, contributed in large part to the wide disparities that the results of such surveys reveal. The reports of many of the surveys are often incomplete. One of the most frequent omissions is that of a description of the educational background, experience and qualifications of the personnel conducting the survey. Another problem that has contributed to the lack of uniformity is the variety of classifications used in describing speech handicaps.

The Organization of the New York Survey:

For the past two years the Board of Education of the City of New York has been sponsoring a survey of the care and education of the physically handicapped children in the New York City Schools. The survey was set up to cover the fields of (1) lowered vision, (2) the deaf and deafened, (3) open air classes, (4) orthopedic, (5) epileptic, (6) cardiac, etc.

In September 1939 the speech handicapped were added to the list of children to be surveyed. I had the pleasure and honor of being appointed the chairman of the educational committee to conduct this part of the survey.

We began by stating certain principles that the speech survey would follow. First of all, it was decided that every part of the survey would be conducted by experienced speech correctionists and that the personnel of the various committees would be selected on the basis of experience and responsibility. (Even the details of tabulation and the like were done by the committee members. None of the work was delegated to graduate students or to clerical help.)

Second, since there were no funds available to defray any expenses or to provide for honoraria, we selected as active workers those qualified people who were available to do work in New York City.

Third, whenever possible we agreed to avoid the pitfalls and weaknesses of the earlier surveys.

With these thoughts in mind we submitted to the President of the Board of Education the suggestion that a group of seven comprise the main committee and that each of the members of this main committee be asked to head a sub-committee. This suggestion was adopted and the further suggestions concerning the personnel of the various committees and their specified duties were also adopted as follows:

1. Subcommittee on Research.
   a. Personnel: Professor George Kopp (Teachers College, Columbia) Chairman, Dr. Jon Eisenson (Brooklyn College), Miss Beatrice Jacoby (Queens College), Dr. R. Corbin Pennington (City College), Dr. Robt. Curry (Brooklyn College).

      Consultants: Professor Robert West (University of Wisconsin), Professor Lee E. Travis (University of Southern California), Professor Bryng Bryngelson (University of Minnesota), Professor C. T. Simon (Northwestern University).

b. Work of the Subcommittee:

1. to gather and to present pertinent data concerning the history and evaluation of speech surveys;
2. to evaluate the examinations for teachers of Speech Improvement given by the New York Board of Examiners;
3. to evaluate the record forms now being used by the New York City Department of Speech Improvement;
4. to gather evidence concerning the thesis, that the earlier the speech handicapped child is treated, the more economical the corrective program will be in regard to time and money;
5. to suggest definite problems of research after the materials for the report have been gathered.

2. Subcommittee on Examining Techniques and Evaluation of Examining Techniques.

a. Personnel: Professor Lou Kennedy (Brooklyn College) Chairman, Professor Gustav Schulz (City College), Professor Walter Wilke (N. Y. U.), Mr. Arthur Bronstein (Queens College).
Consultants: Dr. Dorothea McCarthy (Fordham University), Dr. Marion Monroe (University of Pittsburgh), Professor G. Oscar Russell (Ohio State University), Dr. Mary Shirley (University of California).

b. Work of the Subcommittee:

1. to evaluate present practices in speech diagnosis from the educator's point of view;
2. to evaluate the examination and diagnosis now used in the New York City System.
3. to submit recommendations concerning the classification of speech disorders, as well as definitions concerning speech disorders.

3. Subcommittee on Legislation.

a. Personnel: Professor Dorothy I. Mulgrave (N. Y. U.) Chairman, Miss Ellen K. Donahue (Ethical Culture School), Mr. James H. Healey (City College), Miss Jane Bliss Taylor (Hunter College).
Consultants: Mrs. Mabel F. Gifford (Director Speech Improvement, California), Dr. E. Hodgdon (N. Y. U.), Dr. M. D. Steer (Purdue University), Miss Lavilla Ward (State Director of Speech Correction, Wisconsin).

b. Work of the Subcommittee:

1. to gather pertinent data concerning legislation throughout the country dealing with provisions for educating the speech handicapped in public school systems.
2. to submit a digest of teacher-certification requirements for teachers of Speech Improvement or Correction throughout the country.

4. Subcommittee on Clinical Resources Outside the New York School System.
   a. Personnel: Dr. Smiley Blanton (Cornell University) Chairman, Dr. Earl Chesher, Dr. Henry S. Dunning (Presbyterian Hospital), Dr. Samuel Hemley (N. Y. U.), Dr. William S. Langford (Columbia University, College of Medicine), Dr. Leuman M. Waugh (School of Dentistry, Columbia University).
   b. Work of the Subcommittee:
      1. to survey the resources of clinics—dental, psychiatric, orthopedic, etc.—which accommodate speech handicapped children and which are not connected with the New York City School System.

5. Subcommittee on Philosophies of Speech Correction.
   a. Personnel: Professor Thomas J. Snee (Fordham University) Chairman, Mrs. Charlotte P. de Goll (Hunter College), Dr. George Haefner (City College), Mrs. Alona H. Henning (Hunter College).
   Consultants: Dr. Sara Stinchfield Hawk (University of Southern California), Professor Edwin B. Twitmyer (University of Pennsylvania), Professor C. Van Riper (Western State Teachers College, Michigan).
   b. Work of the Subcommittee:
      1. to collect materials pertinent to speech programs in large American cities such as Detroit, San Francisco, St. Louis, Cincinnati, etc., and also in state programs of Wisconsin, California, Missouri, etc.
      2. to determine what "procedures and philosophies" of speech correction are now being practiced.

6. Subcommittee on Evaluation of the New York City Program.
   a. Personnel: Professor James F. Bender (Queens College) Chairman, Mr. V. A. Fields (City College), Professor Ruth Manser (N. Y. U.), Mr. Egbert Spadino (Hunter College), Dr. Loretta Wagner (Brooklyn College).
   Consultants: Professor Herbert Koepp-Baker (Pennsylvania State College), Professor Harry Rivlin (Queens College), Professor Harry Heltman (Syracuse).

   The work of this committee was made possible by the co-operation of the following educators and physicians who made classroom visits and reported upon them:
   Mrs. Hilda F. Amidon (Director of Speech Improvement, Hartford, Conn.).
   Professor R. Bradley (Willimantic State Teachers College, Connecticut).
   Mr. Arthur Bronstein (Queens College).
   Dr. Robert Curry (Brooklyn College).
   Miss Blanche Dull-Nelson (Norwalk, Connecticut).
   Dr. Jon Eisenson (Brooklyn College).

Professor V. A. Fields (City College).
Dr. Lawrence Goodrich (Director of Speech Improvement, East Orange, N. J.).
Professor George Haefner (City College).
Mr. James Healy (City College).
Mrs. Alona H. Henning (Hunter College).
Miss Mary Cole Hollingsworth (Director of Speech Improvement, Bronxville).
Professor Franklin Hunt (Amherst).
Miss Beatrice Jacoby (Queens College).
Professor Lou Kennedy (Brooklyn College).
Professor George Kopp (Teachers College, Columbia).
Miss Margaret Lakenan (Director of Speech Improvement, Mt. Vernon).
Professor Ruth Manser (N. Y. U.).
Professor Alice Mills (Mt. Holyoke).
Professor Dorothy I. Mulgrave (N. Y. U.).
Dr. R. C. Pennington (City College).
Mr. Earl Ryan (City College).
Professor G. F. Schulz (City College).
Mr. Robert Sonkin (City College).
Mr. Egbert Spadino (Hunter College).
Miss Jane Bliss Taylor (Hunter College).
Miss Gertrude Walsh (College of Mt. St. Vincent).
Dr. Walter W. Wilke (N. Y. U.).
Miss Mary Louise Zerler (Director of Speech Improvement, Yonkers).

b. The subcommittee on Evaluation of the New York City Program was especially fortunate in obtaining the co-operation of the medical committee in making joint visits to teachers of speech improvement. The visiting medical committee was composed of Dr. Walter O. Klingman (Presbyterian Hospital) Chairman, Dr. Arthur Clinco (Long Island College of Medicine), Dr. Fred S. Dunn, Dr. Peter Denker (Cornell Medical College), Dr. Smiley Blanton (Cornell Medical College), Dr. Henry S. Dunning (Columbia Medical School), Dr. Edmund C. Fowler, Jr., Dr. Samuel Hemly (N. Y. U. School of Medicine), Dr. Warren Hueber (Long Island College of Medicine), Dr. Isaac W. Karlin, (Jewish Hospital of Brooklyn), Dr. Stanley Lamm (Long Island College of Medicine), Dr. John J. Levbarg (Harlem Hospital), Dr. Russell Meyers (Long Island College of Medicine), Dr. Edward S. Pope, Dr. Leuman Waugh, (College of Dentistry, Columbia University), Dr. Ira S. Wile (Mt. Sinai Hospital), Dr. Samuel Wortis (New York University, School of Medicine).

c. Work of the Subcommittee:

1. to evaluate the present organization and services of the Department of Speech Improvement;
2. to make pertinent recommendations.

7. Subcommittee on Speech of the Deaf.
   a. Personnel: Dr. Ira S. Wile (Mt. Sinai Hospital) Chairman, Miss Beatrice Jacoby (Queens College), Dr. James F. Bender (Queens College).
   b. Work of the Subcommittee:
      1. to make recommendations concerning the relation of the New York City Department of Speech Improvement to the Speech education and re-education of the deaf and deafened.

It was further recommended that all these committees would be mutually informed of their progress (thus allowing them to profit from each other) because the chairmen of the subcommittees would be meeting to report on progress and to discuss policy.

In selecting the personnel for the various subcommittees the following guiding principles were used: (1) All members were to have experience and collegiate preparation in speech correction work. (2) No part of the work was done by anyone who was not actively engaged in teaching and who had not had at least five years of experience in speech correction work. (3) No teachers in elementary or secondary schools of New York City were appointed because the Survey was directed toward the New York System.

Conclusions:

You will recall that the speech survey was organized in the early fall of 1939. Between that time and June 1940 the various committees have spent a great deal of time and effort. They have answered in detail such questions as (1) what is the extent of the services rendered the speech handicapped child? (2) how adequate are the services rendered at present? (3) how may the speech handicapped be better served? (4) how does the New York program compare with the programs in other localities, and the like. To give you an idea of just one of the tasks that one of the subcommittees undertook: each of the forty teachers of speech correction in the New York City school system was visited at least three times by speech correctionists and physicians. Some of the teachers were visited as many as ten times. Each of the visits was designed to cover one half day. The tentative report is now in the hands of our consultants for criticism and evaluation. We anticipate that the final report will be published by the Board of Education, and that body, of course, will have the sole right to release the findings to the public.

One word more. The New York Speech Survey could not have been accomplished with such ease and good feeling and effectiveness without the whole-hearted co-operation and advice of our able colleague, Dr. Letitia Raubicheck, Director of Speech Improvement in the New York City schools and her staff. It was a joy to work with this department and my distinguished colleagues on the various committees.

SECTION ON
TECHNICS, UNIQUE CASE HISTORIES AND DISCUSSIONS

Edited by
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(All contributions submitted for publication in this department should be sent directly to Dr. Palmer at the above address. That includes short disagreements with facts or conclusions in articles published by the Journal. Articles longer than two pages will be sent to the Editor of the Journal however.)

A CASE OF DELAYED SPEECH

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Queens College Speech Clinic

The requirements for normal speech development in children are (1) functioning hearing acuity and aural memory of speech sounds; (2) speech organs that are anatomically and functionally adequate; (3) normal intelligence; (4) acceptable speech patterns or models; (5) a desire or need to speak. If any one (or more) of these requirements is not present or is present in an atypical amount or degree delayed speech may result, as in the following case:

> Bob was four years and two months of age when he first came to the Speech Clinic. His general health and speech mechanism were excellent. There was no history of the usual childhood diseases. His hearing acuity was judged to be normal. His intelligence, as measured by a battery of performance tests, was normal. His comprehension of speech was above average for his age. His mother's speech was devoid of handicaps. Yet his own speech was delayed, that is, he did not use words. His desires were expressed by gestures, gruntings, and an occasional neologism.
>
> A study of the family situation revealed that Bob was an only son and grandson, living with his parents and two grandmothers. His wants were not only satisfied immediately but were constantly anticipated by the three women of the household. ***Bob had no need to speak.***
>
> After the diagnosis was explained to the parents, the advice was given to place Bob in a pre-school play-group where he would need to express his wants in words. The advice was taken, and in six months he was a normally communicative child with an average oral vocabulary, and articulation free from defects except some slight inaccuracy in the production of l, v, and s.

This case of delayed speech was corrected by the simple expedient of allowing the *socialization process* to function normally. Only after Bob had acquired experience in verbal communication was he given speech correction for his defective l, v, and s sounds. As a matter of fact, the corrective program for these sounds was not initiated in any formal sense until Bob entered kindergarten at the age of six.

A NEW TECHNIC IN THE CORRECTION OF PERSISTENT FALSETTO VOICE IN THE MALE. A REPORT ON TWO CASES

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Institute of Logopedics,
University of Wichita

Great difficulty is sometimes experienced in cases that have a persistent falsetto voice even though the larynx appears perfectly normal for the age of the individual. Occasionally weeks of tedious work are necessary to produce the change. The following description is not intended to serve as a complete outline of the method to use with these cases, but describes the results accomplished with these two cases, the correction being immediate and permanent in both cases.

Case 1. Male, 29 years of age. At fourteen he went to a basketball game and yelled himself hoarse. After the game he found he could not talk, and the next day discovered that he could only speak in a falsetto voice. His voice had commenced to change prior to attendance at the game. He was suffering from a tremendous feeling of inferiority, and never spoke to anyone if it could be avoided. Laryngological examination by the laryngologist to whom the case was referred reported the larynx was entirely normal.

Case 2. Male, 15 years of age. Voice had never changed, and was a very high falsetto, ridiculously out of place, for he was large and well-developed. Laryngological examination by the physician to whom the case was referred was negative.

Shortly before Case 1 came for examination the author had been studying the possibility of various positions of the head affecting the production of the falsetto voice. He requested Case 1 to hyperextend the head, assisting him to get it as far back as possible. In this position he requested him to say the vowel a as in father. Somewhat to his surprise the vowel was uttered in a normal tenor register. He then asked Case 1 to straighten his head while continuing to sound the vowel. The voice continued normal. After some thirty minutes of practice Case 1 was able to speak perfectly normally. Correction has persisted with no relapse for over five years.

Similar technics were used with Case 2, with immediate results and no relapse, the only differences between the two cases being that Case 2 had a very nice baritone, and learned correct production in about fifteen minutes.

The two cases and the technic offer many interesting speculations as to the mechanics involved.

The technic probably should only be used in functional conditions, and under the advice of a laryngologist.

VARIED CASE HISTORIES

Submitted by

DEPARTMENT OF SPEECH CORRECTION
Minneapolis, Minn., Public Schools

CASE No. 1

LILLIAN F. READ

The case of Allan has been chosen because it best illustrates a clear cut diagnosis and the success of an intelligent co-operation on the part of the child, parent and teachers.

Allan is a second grade seven year old boy of Jewish heritage. He is an only child. He had a stutter varying from medium to severe clonic and tonic spasms. When first entered in speech class at kindergarten level he had a letter substitution a "w" for "r " which was cleared at the close of the first period of speech training.

The early childhood history showed normal healthy birth and infancy. He walked at fourteen months said words at eighteen months and sentences at two and one half years. There was no childhood disease history. However there was an accident history. At fourteen months he fell out of bed receiving a severe bump on the head causing a black eye from an injured blood vessel. Three days after the accident Allan had a paralytic convulsion and was taken to the hospital where his spine was tapped.

The onset of the stutter was reported as about five years of age. The mother reported he was right handed but had shown some left tendencies. The mother felt she had not influenced his choice in the use of his hands. The boy has a very pleasing personality, alert and inquiring mind. However, he is also very self conscious, particularly sensitive about his stutter, using many avoidance mechanisms and starters. His feelings are easily hurt and he finds it very hard to go into new situations or make new contacts.

His early school history shows that he found it hard to adapt himself to the group. Being an only child, he had been very much sheltered with very few child contacts. He had been in an atmosphere of adults, protected and waited upon hand and foot. In addition, both parents were overly anxious. The father brought him to school and paced up and down outside the kindergarten door unable to leave him. When he did, he returned early to accompany Allan home.

Allan was very clumsy in rhythms. Skipping was difficult and his handwork, while neat, was very slow and laboriously done.

The father and mother had good speech and health. Both parents were right handed, though the mother admitted left tendencies in

herself upon contact with the second speech clinician. The father is a successful druggist and the home has high standards of health and sanitation. The home is very comfortable and above the average in the district.

The heritage history shows left handed male cousins on the father's side. Paternal grandmother—left. There have been twins on both sides a few generations past. No strabismus nor stuttering known on either side.

The informal tests showed definitely that dominance had not been established. There were many left handed responses such as sweeping, shoveling, opening a jar, dealing cards, bouncing, use of hammer, screw driver, threading a needle, kicking, winding a watch, winding thread, opening a knife. The use of scissors was right, but very awkwardly handled. The mother reported that observation of the child's activities between kindergarten and second grade had shown that much more left sidedness was present than she had realized on first interview.

The clinic, on reviewing the history and testing, advised the child should be returned to the left side and that a mental hygiene therapy be instituted to aid child in facing his stutter.

Therapy:

The mother was called in and the results of the tests and the recommendations were given her. Following this, the child was ill and out of school for two or three weeks. When he returned to school, he reported that he had been eating with his left hand for two weeks and found it very easy to do.

The writing therapy for shift to left side was started and in no time he was writing as well as he had with his right hand and with much less tension. Allan did much writing and talking at home, bringing his papers faithfully each class period.

The stutter flared up decidedly and he was greatly disturbed as were his parents. It took much encouragement and reassurance from the clinician to keep the child and parents from swinging back and being satisfied to stutter. However, they were assured that this was to be expected and that it was further proof that we had our finger on the causative factor or the flare up would not have been so severe. The child was satisfied with this explanation and has consistently and earnestly tried to establish his left side and right dominance. Accompanying this shift was a mental hygiene which sought to give the child an understanding of stuttering. He was gradually led to study himself in the mirror while stuttering, to see exactly what he did when having a spasm. He was surprised to find he really didn't look as badly while stuttering as he had imagined he did. He was encouraged to let his spasms come through freely and effortlessly so that he could find out just what it was that he would have to change. He found that he had to discard many starter words such as "ah," "oh," "say." That he had used a running

start, backed up and started again and again, and if these methods didn't work, he forced through the spasms with much facial distortion. He looked away from people or over their heads. When he had a good understanding of what he did, we set about to substitute other patterns for the old. We took easy reading material and scored it for words which we felt sure he would have no difficulty in saying. Then he deliberately faked a light clonic spasm on these words. He found he could vary this pattern to suit himself and soon did it with ease. When real spasms occurred he was first advised to leave the word out completely. The next step was to make use of the "feeling" that a spasm was about to occur. He was then to "stop" vocalizing, to wait until he felt a "release of tension" and then to go on with that part of the word which he could say following the relief from the spasm.

He was soon able to cut down the time of waiting and his speech was only interrupted momentarily. He used this "stop-go" therapy as a spasm handling technique. All through this he was encouraged to fake spasms so that he at no time forgot that he was a stutterer. He was made to feel that "good stuttering" was his goal.

In his class room he talked about his stuttering. He explained what he was doing in speech class and why he was doing it, and from then on, he stopped trying to hide his stutter and as a result was no longer anxious and worn out from the effort. He became president of his room and conducted the morning meeting using "faking." The children became very much interested. He became quite the center of attention, and his "ego" was greatly satisfied. In the past he had refused to go into other rooms on errands—soon he did it willingly. He ceased to complain that children teased him and he lost that anxious, furtive, unhappy manner. He looked people in the eye and seemed comfortable. His teachers made many opportunities for him to be a leader and reminded him to "fake" when he became unusually "cocky" about having no more spasms.

The parents were co-operative. They kept him constantly carrying out the therapy at home. The father helped him to establish the left side in sports. The mother helped him to establish the left side in eating and encouraged, and reminded, and supervised his writing and talking therapy at home daily. They used "faking" with him and made a game of it. They were the most whole hearted, intelligently co-operative parents with whom it has ever been my good fortune to work. Today his spasms are few and far between. These he handles easily, comfortably and with apparently no emotional reaction.

I am dismissing him for the summer as "much improved," but I am not calling him a cure, for our constant aim has not been "cure the stutter" but handle the spasms comfortably and with as little effort and disturbance as possible to himself and listeners. After a period of several years, if his present success continues, he might be listed as an "arrested stutter".

CASE No. 2

SADIE M. CARLSON

Identification Data:

When Allan M. entered class last fall, he was a stutterer of medium severity with spasms of both tonic and clonic types. He also had a lateral lisp on the "s-sh-ch and j" sounds. He is eleven years old and in grade 6B at present.

Developmental History:

His developmental history was normal, beginning of walking and talking were at an average age. There were no injuries at birth. He was breast fed for nine months. He had chicken pox of medium severity at one year, glandular trouble with an operation at two and a half years, and his tonsils were removed at three years. He was frightened severely at one and a half years on Hallowe'en; at two and a half years he cut his knee severely which made the father very frightened and excited and so frightened the child. It was at this time he began to stutter.

Personal Characteristics:

Allan is cheerful, dependable, friendly, and well mannered. He is well liked by all his associates, and does good school work.

Family Data:

He has one sister, four years older, who is right handed and has normal speech. His mother is a charming person, understanding and co-operative. The father is a stutterer of the tonic type and was formerly very nervous.

Remedial Measures:

This is Allan's fourth time in a speech correction class. In the 1A-2B grade he attended forty-two times. His stutter was judged as severe. In the 4B grade he attended only fifteen times as the family moved to New York for the winter. When they returned in May it was found that besides the lisp he still had quite a marked stutter. He had a habit spasm in the form of a twitch in the cheek and eye which probably was developed as a crutch to avoid severe spasms. Dr. Bryngelson's advice was sought. He found that he was still ambilateral in the central nervous system as indicated by the angle board test and was left eyed. He was ambidextrous in the peripheral mechanism up until school age when he gradually transferred to the right side in most of his activities. He comes from left handed stock on both sides of the family—a paternal aunt and maternal uncle and two cousins being left. One of the cousins stutters. Dr. Bryngelson recommended that he develop the left side entirely, that he develop a voluntary control over his "tic," that he needed more stimulation and drill on the "s" but that he had

learned to make a normal "s." It was too late in the year to institute the left shift in regular class work but the mother was instructed how to proceed during the summer. She took him to the University three times a week during the summer vacation for special help. The following year, not having a speech teacher in the school, he went to a neighboring school a half hour twice a week for help in a speech class. At the end of that year he was judged much improved, his facial tic controlled, and had less nervous habits. He had shifted to the left in most things but I discovered last fall that he had continued drawing in his regular room with the right hand, and was also using his right hand for ball throwing and batting.

When he entered class this year, he was discouraged about his writing as he said he could not make it legible when he tried to keep up with his class. We, therefore, began at the beginning of the handedness outline, working for the "push-pull" movement with the left hand, using the two-spaced "u" exercise and gradually making it smaller. He wrote the words of the outline during the writing-talking therapy and individual letters were segregated only when he had difficulty in making them. He worked first on the board and then on paper. Before beginning any word we discussed height, slant, and any point that needed watching to make a good looking letter. He fulfilled his outside assignment of so many pages to be handed in at each class period. When each word was checked as correct he started on the next one. The capital letters were also handled in this way. His teacher co-operated by not requiring speed from him. If he could not keep up, he was given another time to finish the work. After the outline was finished he copied stories, writing the whole word and then only the first initial. We kept samples of his writing that he might see his improvement from time to time. We did a good deal of ball work—bouncing, batting, catching and throwing, both indoors and out. We used rhythm games in bouncing and he is now practicing for the pentathlon and using only the left hand. We held tournaments in Japanese ball games, ten pins, target games, etc., keeping the scores for a period of about three months. This helped to keep up interest.

We worked a good deal on the analysis of his stutter before a mirror. Once in a while the former facial tic would insert itself so he used negative practice for that. Any undesirable attitudes he may have had regarding his stuttering seemed to be corrected by the mental hygiene inculcated in the faking of his spasms and the repetitive voluntary type of stuttering which he did both in and outside of class. He was given definite assignments regarding these situations, sometimes to be carried out alone and sometimes with another stutterer. In class we worked out a little skit involving a well-adjusted stutterer contrasted with a poorly adjusted one. This served both as a motivation and a good method in putting across desirable mental hygiene. "Stop and go" and the "bouncing" pattern were both used as methods of handling the spasms. With Allan "Stop and go" seemed to be the better, probably because the

clonic spasm was his chief spasm when he began control—the tonic had practically cleared up with the establishment of an objective attitude.

We did not stress the articulatory problem until his stuttering regime was well launched. This second term, however, he used some of the "writing-talking" periods for words containing the sounds of his lateral lisp. He wrote lists of words, sometimes a column of different initial "sh" words or whatever sound he was working on at the time and sometimes columns of the same word. While he was giving topics reading or conversing, I corrected him when he had an incorrect lateral emission. Soon he began correcting himself. At home his mother gave excellent co-operation. He very seldom stutters now.

Results:

His writing has improved a great deal, he has no trouble in keeping up with the work of his class now.

CASE No. 3

ELEANOR S. SPATES

The following case history of Hiram ——— was obtained through several interviews with his mother between the dates of 10–19–38 and 5–19–39.

I. Speech Examination

Hiram's speech was first examined by one of the speech clinicians in a survey made the first week of school when a severe articulatory disorder was recorded. On first day of attendance in speech class and on further observation in his classroom a severe tonic and clonic stutter was noted. For the first three months he was enrolled in two classes one in the morning for lower grade stutterers which lasted one half hour twice a week and the other a fifteen minute class in the afternoon for articulatory cases. On receiving word from his mother that he seemed to be showing anxiety and straining before a mirror at home he was withdrawn from the afternoon class until the severity of the stutter lessened. After another three month period on recommendation of the speech clinic and an apparent improved condition of stutter he was re-entered. He was given individual attention for both secondary stage of stutter and articulatory defect. By continuing with stutterers in the primary stage of stuttering he was given speech success and help in building up of dominance through printing and talking exercises and games. His defective sounds were l, r, th, and lateral s, z, sh, ch and j.

Admission by mother showed definite evidence that enough attention and objection was brought to child's mind as to seriousness

ot defect. The parents were asked to make known to Hiram their definite acceptance of stutter and articulatory defect. Early indications on handedness preference revealed the use of the right hand in nearly all acts. He sucked thumb of right hand up to two years of age but only on retiring. He is right eyed.

II. Physical Examination

Dr. S——, school physician, gave Hiram a physical examination on June 19, 1938. The tonsils and adenoids were checked indicating need for removal. On November 18, 1938, an individual visual test was given by school nurse revealing defect of 20–30 in both R. and L. eyes. Mother was notified and consulted own physician who showed little concern. Dental examination was made October 26, 1938, and a report of "good" was given.

III. Personal History

A. Developmental.

1. Place and date of birth.
   Hiram was born on September 11, 1932. At the time of child's birth his mother was twenty-seven years of age and father was in his late thirties.
2. Pre-natal conditions.
   Mother had no particular physical, emotional or mental strain during pre-natal period. Although very nervous she was otherwise in good health. Hiram was a slightly premature child. The doctor believed mother was just too active—the reason for early birth.

B. Birth and Early Childhood History.

1. Birth and nutrition.
   Hiram was an eight and one-half month baby of normal birth, weighing nine pounds. He was breast fed for two months and bottle six months. The general nutritional history reveals no feeding difficulties, rickets nor convulsions. He walked at one year. His first and second teeth were cut at five months.
2. Accidents—shocks—diseases.
   At the age of five years Hiram ran into a lamp post while coasting down hill. His face was swollen and bruised on the right side. This had no apparent ill effect on speech.
   His early childhood diseases started at five months when he had bronchial pneumonia which left him with a general weakness. At four years he had mild cases of both measles and chicken pox. A severe case of whooping cough at five years was of much concern to the doctor in consultation who thought he stiffened to a convulsion.
3. Personal Behavior.
   a. Sleeping habits.
      Hiram retires at an early hour. He falls asleep easily, rests quietly and experiences few night terrors.

b. Routine habits.

Patient wants to be independent of mother's help by dressing and waiting on self. Is helpful, willing in performing duties and running errands. He attempts most any task desiring approval and praise. He has never had involuntary control of bladder since trained at twelve to fourteen months.

c. Play life.

A great deal of energy and action is put forth in all his play. He is gregarious and gets along well with children. Unfortunately he has not been able to play with children his own age and sex but not by preference. Up until present time he has played with girls when not with brother. His latest "pal" is a boy thirteen who attends a parochial school. Mother says he has always been extremely awkward and tense in all manual acts. His co-ordination has increased greatly in all rhythmical games through help and stimulation in speech class. He is very much elated at the success.

His parents are beginning to assist in the development of one sided activities since a definite side has been established. The frequent visits to relatives who live on a farm stimulates his enjoyment of animal stories and pets.

C. Personality Traits.

At first Hiram was shy, volunteering very little both in classroom and speech class. His progress in school has given him a definite feeling of success helping to create in him a desire to compete. He has a keen sense of humor and is full of mischief admiring children who are inclined to be behavior problems. He craves attention and approval. He is friendly if first approached, easily disciplined but occasionally has stubborn streaks.

D. School.

The child was five years of age on entering kindergarten and has been regular in promotions, making good adaptation. He did average handwork in kindergarten having little success in oral work. He is generally alert and his mental development has been normal. Both kindergarten and first grade teachers have died following an illness while he was enrolled in their classes.

Information given on cumulative record card is as follows:

Grades in 1B	Grades in 1A
Reading—Improvement	Reading—Improvement
Language— "	Language— "
Social Studies— "	Social Studies— "

Special Abilities and Interests—None.

Personality assets: friendly, happy.
expresses self poorly.
conscientious worker.

Needs help with.....encouragement in self-expression, praise.

Behavior modified by....nothing.
School ability tests.....Binet—I. Q. 100.
M. A. 5-8 C. A. 5-8

IV. Family History

A. Physical, Psychological.

The health of both parents is good. Their speech history reveals no defective qualities. Hiram's father is right handed while mother is by nature left but was changed to right in second grade. They are both of even temperament.
He has an eight year old brother Allen who is a right handed normal speaker at the present time but talked baby talk to the age of five.

B. Social.

The family are in comfortable circumstances. Home conditions are favorable. Father is employed as "chef."
Both parents are of American birth, the father of Norwegian descent and mother German. Their attitude has been one of co-operation, at no time showing a great amount of concern regarding Hiram's speech. There is a fairly well balanced emotional stability among members of family. Both father and mother attempt to have reasonable discipline.

C. History of Sideness.

The heritage history shows the father to be right handed and mother left. The paternal side of family reveals all right sidedness with the exception of one first cousin, a girl, who is left in all acts but writing. The maternal uncles are also left except for writing. The maternal grandfather is also left. There is twinning on the paternal side.

Dominance Test Given October 19, 1938

Informal Activities.

Throwing RR
Batting RR
Rolling RR
Bouncing RR
Kicking LRL
Sweeping L side R on top, awkward
Shoveling L side R on top, awkward
Dealing cards RR
Arm in coat sleeve RLRR
Hammering RR
Screwing RR
Threading L pushing needle with R or vice versa
Drinking RR
Eating R, knife RR, fork RR, spoon RR
Salt shaker RR
Writing on board RR
Writing on paper RR
Erasing RR
Combing RR
Brushing teeth RR
Opening jar RR
Beans in jar RR
Cover on jar RR
Winding watch RR
Winding thread RLR
Turning beater RR
Opening knife RR

Formal activities:

Peg board

Pegs in board	R. H. I.	2 min. 32 sec.
	L. H.	3 min. 38 sec.
	R. H. IV	2 min. 33 sec.
	L. H.	3 min. 35 sec.

2 min. and 8 sec. in favor of R. H.

Recommendations.

Continue on right side for the present. Use mental hygiene. Arrange schedule to give individual attention for stutter if possible. Continue stimulation for letter sound substitution.

Treatment used: From 9–6–38 to 6–9–39.

For stutter:

1. Mental hygiene procedure for child in secondary stages of stuttering was given such as bringing stutter out in the open by admitting and accepting it unemotionally.
2. He received individual attention in spasm control with the use of full length mirror.
3. Attempts were made to remove all speech conflicts in school and at play.
4. While in attendance with group of stutterers in the primary stage of stuttering he was given success in speech through simple and pleasant speech situations in story telling, oral reading, relating of incidents, speech games, etc.
5. Parents were advised as to mental hygiene procedure to be used in the home so that all home situations are pleasant.
6. The establishing and building up of a dominance in the left brain and right side was accomplished through stimulating the development of one-sided motor skills, printing and talking exercises, drawing, ping pong, tennis, baseball, etc.
7. The use of relaxation carried over into all activities was practiced.

For articulatory defects:

1. Auditory stimulation.
2. Mirror work for correct placement.
3. Keeping of scrapbook consisting of pictures, collected or drawn, relating to sounds to be corrected for the purpose of stimulating and building up correct patterns in the brain.
4. Story telling and reading of easy books.
5. Speech games.
6. Learning of rhymes for tongue and lip gymnastics.

Results of treatment—(as recorded).

Greatly improved—Frequency and severity of stutter lessened.

Articulatory defect cleared with the exception of the lateral s, sh, ch, j.

SPECIAL PROJECT

BERNEICE R. RUTHERFORD
1939

Speech correction class periods are frequently much too short to correct a case of letter sound substitution, or to set a stutterer on a course he can go alone. To help these speech cases continue with a definite program beyond the regular speech class the following procedure was used this year. No scientific evaluation has been made of its worth. It has stimulated interest and has promoted a very businesslike atmosphere in the groups in which it has been used.

The first step of the plan was a series of round table discussions with groups of parents. Some of these fathers and mothers had been contacted before. Some were new to the building. In planning the round tables several factors were considered. Parents of children with similar difficulties and comparable ages were invited to the same conference. The speech correction teacher outlined first of all general and then more specifically the neurology, physiology and psychology (mental hygiene) as it pertained to each group. Then discussion on specific cases came about, for of course each parent was interested in applying the general information to his own child's case. In some groups questions came thick and fast; in some groups the speech clinician had to stimulate questioning by asking some herself.

After this period of background presentation, the plan of assignments for work outside of speech class was explained to the parents. Briefly this plan included (1) listening to speech with definite objectives such as, "Listen to ten persons you hear speaking. Keep a record of how many of them have clear sounds; (2) discovering the specific speech needs of himself; (3) observing speech needs of others; (4) discovering that speech is more than just a sound group, that it is communication; (5) realizing stuttering is a way of speaking; (6) advertising ones stutter thereby putting it on a verbal level. For the latter this assignment was one used: "Advertise your stutter to at least one person each day. Write the names of the persons and their reactions." Penalize yourself if you fail to do this by advertising to three persons the following day." Parents were given concrete examples of how assignments were to be completed. It was pointed out that assignments would vary from individual to individual and for one individual from week to week as to length and difficulty. The criteria for a good assignment is five-fold. It was used in making out the assignments.

1. The student must know what he is doing and why.
2. Situations should be short enough to be performed within a short time.
3. Assignments should be specific as to time and place.
4. Assignments should be vivid (not boring).
5. Assignments should have an objective check.

Preparation of daily assignments for all speech correction cases would be a stupendous task. But preparation of assignments extending over the week with daily sections is not quite so difficult (though the criteria must be heeded). Further it is not advisable to give all children assignments, so the number is cut considerably.

The plan was next explained to the children chosen for participation. The idea of assignments seemed to appeal to them. If assignments were delayed at any time they asked for them. At no time did an assignment seem to be a burden. Many parents indicated by telephone, in writing, or in personal conference that they were better able to help children than previously.

The next step was the writing of assignments by the child himself. Some children who had been studying their speech problem for a considerable period reached that stage fairly soon. In each instance the child-written assignments were checked by the speech clinician. Suggestions were necessary in fewer cases than would be supposed.

The above plan was in operation until after the Christmas holidays. About that time some assignments were returned partially completed and some were "forgotten." Whether the broken routine occasioned by the holidays or loss of interest was responsible, isn't clear. A change of procedure was indicated, the definite assignments still appeared to be desirable as a tool. Accordingly these assignments are not written in speechroom work books. Each child in the plan has made and decorated his own book. The assignments usually have a central theme for a varying period of time with specific daily plans built around this central theme. The speech teacher's job is to contact each child on his own problem as frequently during each period as the situation permits. The number of times and the length of contact depends upon the case and varies from day to day and child to child.

This plan seems valuable because it permits of more individual, concentrated work. It focuses attention upon individual needs and at the same time gives each child a definite guide by which to work. Further it gives them opportunity to work out their own plan of action, first under guidance and then more and more independently. Some probably will never be able to carry on by themselves. But some are now writing their own plans in books at home, without supervision. Some of these have been brought to the speech clinician for her opinion as to their worth. To date they have been quite worthwhile. Another value of this plan is the closer knitting of one more home and school activity. Every parent has a very definite part in the speech education of his child. Many parents are unaware of their important role. Acquainting them with the background of speech, the need for good speech, of how to prevent defective speech and showing them the part they can play in developing or correcting speech is probably one of the most important phases of this plan. This plan also includes the use of the community. Sometimes assignments call for observations of or conferences with persons in the community, a visit to a neighboring school or community center. It would seem that the plan is of value because of both its intensive and extensive aspects.

CASE No. 5

ELLA M. SULLIVAN

Phyllis had spent four months in kindergarten B without having once spoken to her teacher or taken part in any class activity. Most of the time she stood in the corner not paying any attention to anyone. The first few weeks she cried constantly. Her brother, who was in first grade, brought her to school every morning and as soon as he left the kindergarten she began to cry. At times she permitted herself to be led around by the other children, who seemed fond of her. Gradually she became interested in the play house and seemed to enjoy dressing and undressing the dolls and pushing the doll carriage, but refused to speak to anyone. The kindergarten teacher was patient and sympathetic with Phyllis and hoped every day she would begin to talk and take part in the regular kindergarten activities.

By the end of the term both the kindergarten teacher and the principal decided something should be done, so they asked me to take Phyllis in speech class for observation, study, and enriched social experiences. Her teacher was sure that Phyllis wouldn't leave the kindergarten alone without screaming and crying, so I invited two friendly little girls in the kindergarten to bring Phyllis to the speech class room. She seemed interested in the games the children played but refused to speak. She just sat in her chair listening attentively and watching everything.

In the meantime I talked with the mother. I learned that Phyllis' birth had been normal and that she had begun to walk and talk early. She was very active at home and talked incessantly. She made so much noise that she disturbed her father who worked nights and slept days. She and her brother Robert, who is two years older, played nicely together. She also has a brother three years old. The mother was greatly surprised to hear that Phyllis refused to talk in school because she had even noticed her talking to men working in the street near their home. The immediate family nor any of the relatives had ever considered her a bashful or timid child. The mother reported this exception. Phyllis is afraid of nurses and doctors and of anyone in white. When four years old she had her tonsils removed at the University hospital, remaining there over night. She was badly frightened. The same year she was in the General hospital for two weeks with an eye infection and ever since she is afraid of nurses and doctors. The first time she went to the dentist she cried and made a dreadful fuss.

During the interview with Phyllis' mother I had Phyllis come to my room. She smiled when she saw her mother but wouldn't speak. However, she nodded her head in response to questions and promised to talk next time she came to speech class.

The next time I saw Phyllis she seemed more friendly and acted as if she wanted to talk but something seemed to be holding her

back. She took more interest in the games and even joined in, but still wouldn't talk. After another week of being very kind and patient I decided to become more firm. The next time she came to class I told her she had promised both her mother and me she would talk and I had given her two chances and still she refused to speak. So I said she couldn't go back to the kindergarten until she said something. I completely ignored her for about an hour, conducting my classes in the usual manner. Finally I heard a cry and she came running over to me saying, "I want to go home," to which I replied, "You may go home, Phyllis because you have talked as you promised." It was dismissal time when I brought her into the kindergarten. She was still crying but between sobs the kindergarten teacher heard her say, "I want to go home."

From that time on she talked every day. When she came to speech class next time she brought one of the kindergarten dolls with her. She counted the chairs, first counting them herself and then letting the doll count them. I discovered she couldn't count to ten. After several repetitions she learned to do so and after that wanted to count everything, even the buttons on the principal's dress. In the meantime she wanted to talk all the time, in fact, would interrupt the conversation with pointless questions.

I also discovered Phyllis didn't know her colors. She had a good time playing color games with the other children but had difficulty in remembering the names, and associating them correctly.

About a week after she began talking she was examined at the Child Study Department. The appointment was made several weeks before at the time she refused to speak.

The findings of the Child Study Department were as follows:

"On the Revised Stanford Binet Test, Form L, Phyllis scored an I. Q. of 65. C. A. 5-11 and M. A. 3-00.

"Vocabulary, memory, picture discrimination were all exceedingly inferior. Her responses were frequently entirely irrelevant, and her attention proved to be consistently poor. However, considerable caution should be used both in the interpretation and acceptance of this intelligence quotient, since these results may be influenced by factors which at present we do not fully understand. Nevertheless, the score indicates the functional level at which Phyllis performs at the present time.

"In order to obtain confirmatory data on test results the Goodenough Drawing Test was administered, on which Phyllis scored a mental age of 5 years, 6 months, and an I. Q. of 93. On performance tests she ranged from below 5 years to 8 years. These scores reveal that possibly Phyllis may be a child whose rate of general maturation is very slow.

"It was interesting to note that she talked a great deal during our contact with her. However, a study of her speech content points to the presence of much pointless verbalization. She frequently repeated the phrase, 'I'm a good girl, ain't I?' in

response to various questions on the examination. She was very distractible and seemed to be quite dependent upon others.

"In general she may be classified as a socially and intellectually immature child who should not be definitely diagnosed at the present time with regard to mental level. It is recommended that she be retained in the kindergarten for another semester, and that she be called for re-examination before promotion in 1940."

On May first Phyllis was transferred to Hiawatha school. At this time there was a marked improvement in her social adjustment both in speech class and kindergarten. Whenever she finished any handwork she would ask to go to the office to show it to "Erickson." Erickson was the name she called the principal with whom by this time she was in rapport, through the interest and effort of Miss Erickson. She talked freely with Miss Erickson about her childish achievements.

It seemed extremely unfortunate that it was necessary to change schools at this stage of her social development. Her present kindergarten teacher reports that she seems very passive, and adds little to the group, though she talks when engaged in conversation.

CASE No. 6

M. E. CHAPMAN

I believe that most of us who deal with stutterers find that they need help in the problems of adjustment.

A group of six stutterers, ranging in age from 9 to 12 from the fourth, fifth and sixth grades, presented a very interesting problem to me this year. I have selected one of these cases to tell you about. A brief resume of his history will give you a picture of the boy.

Resume of History

Bob is eleven years old and in the sixth grade. He has a severe stutter with frequent tonic and occasional clonic spasms. The disorder began with speech at the age of two years. He was slow in learning to talk. The disorder seemed worse this fall than formerly. Excitement and fatigue increase his difficulty. He has a history of right handedness and is left eyed. He is troubled with enuresis and squints badly when he removes his glasses. He has a normal birth history. Pneumonia at five was his only severe disease. He enjoys the company of older people and is not fond of playing with children his own age. He is a poor loser. His I. Q. on an Otis test is 116. The mother is a stutterer and is ambidextrous. Test results were mostly for the right side and the clinic recommended continuing on the right side for the present, also mental hygiene and relaxation.

The Problem

The chief problem was to get this boy to face his disorder. He had so many tricks for trying to cover up the stutter and as a result was exceptionally fidgety and fearful.

Therapy

The subject of stuttering was introduced by making a dictionary of speech terms we would encounter as time went on. As we understood more thoroughly what these terms meant we checked them in our dictionary. The following are some of the terms we listed:

speech spasms	prolongation	clonic
dominance	voluntary	starters
hemisphere	force	bouncing
sidedness	postponement	effortless
primary	repetition	rationalization
secondary reactions	tonic	

We discussed stuttering and its various accompanying difficulties, such as fears, withdrawal, overly bumptious behavior and the like. Then I asked them to write on the subject, "My Stutter." The following is Bob's contribution:

My Stutter

"I am a stutterer. I stutter more in school than at home because I am more afraid of stuttering at school than at home. When I get excited I stutter the most.

"I have started to go to speech class. There we learn not to cover up our stuttering. We learn to advertise our stuttering by going to the store and telling the man we stutter. We tell our friends that we stutter and show them a sample of our stutter. We study our symptoms in speech class. These are some of my symptoms of avoidance. I change a sentence around. I was supposed to say to my teacher, 'What paper should I pass out?' but I said, 'What paper do you want?' I couldn't say 'nice' one day so I said 'pretty.'

"I am supposed to use my right hand for everything and this way build up the left side of my brain.

"We collect speech spasms. Spasms mean words that we stutter on. We bring in lists of these words to class."

The next phase of the adjustment program was to analyze our speech more thoroughly. We tried to find out what we did when we stuttered, our bodily movements, grimaces, and the like. This was done by studying ourselves in the large mirror as we talked, read and paraphrased. The stutterer was assisted by the group when he failed in self-analysis. Bob's analysis was as follows:

Analysis of My Speech

"I move around a lot when I talk. I fool with my hands. When I start a word and get stuck, I duck my head and push a lot and use

force. I get fussed and my face and neck get all red. I stall around a lot and put in extra words like "ah well." Sometimes I race my words to see if I can get them all out before I have a spasm. I sometimes substitute words for other words like 'fine' for 'grand.' Sometimes I change sentences around. I giggle to cover up my real feelings."

Home assignments were made and a record kept of attendance to this job. As a spur to activity a prize to all who showed a complete record was given. This consisted of a simple ten cent prize, such as an airplane package. Our assignments at first had to do with collecting spasms, keeping a written record of certain quotas of words stuttered and how we stuttered them and where we were when we stuttered. This list was brought to class. When we had done a good job of catching our spasms, we began the practice in reproducing those we had. We wrote up the value of advertising in the following way, using it for writing-talking exercise.

Advertising

"We tell other people about our stutter, in class and outside of class. When we do this we don't have to think up deceiving tricks anymore. We make other people more comfortable and we become less afraid and fit in better with other people when we aren't trying to hide our stuttering. Stuttering doesn't seem so awful when you talk about it. Other fellows don't get a kick out of teasing you when you don't get mad at them but laugh with them."

An example of our home assignments at this stage is: "Go to five different places and fake a spasm on every other word you say. Keep a list of places and what you said. Underline the words you faked spasms on."

When we were working on this phase one of home assignments was: "Write out a conversation between two boys, one boy is a well adjusted stutterer; the other boy is poorly adjusted." Also, "Write out a conversation illustrating adjustment." The following are Bob's contributions:

The Stutterers

Ned: "How many persons have you advertised your stuttering to?"

Ted: "Well, you see I was sick."

Ned: "I saw you playing outside with Bill yesterday."

Ted: "What do you think I want to spill the beans for?"

Ned: "What do you go to speech class for if you don't try out some of the things?"

Ted: "Well, I'm afraid to advertise because the kids will tease me."

Ned: "Before I told them they all teased me, but now that I have told them all about it, they never tease."

Ted: "Well, I'll try and see if it works."

Play—Scene I

Two Unadjusted Stutterers

Characters—Pete and Bill Scene I—F. W. Woolworth's

Pete: "I want an airplane model."
Bill: "So do I."
Pete: "You ask for them."
Bill: "No, you do."
Pete: "I don't need an airplane model. I'm building one at home."
Bill: "So am I."

Scene II

After a month in speech class—same place

Characters—Bill, Pete and the Clerk

Bill: "I'm going to buy an airplane."
Pete: "So am I."
Bill: "I'm going to fake some spasms."
Pete: "So am I."
Bill: "Ah, ah, I wah-wah-want ah-ah-ah-ah-ah airplane."
Clerk: "What?"
Bill: "I go to speech class and I am supposed to advertise my stuttering."
Clerk: "Oh, I see."
Pete: "Sh-ah, I wah-wah-wah want one tah-tah too."
Clerk: "I suppose you go to speech class too."
Pete: "Sha-sure, is it ever a lot of fun."
Both Boys: "Tha-tha-tha-thah-thah thanks."
Clerk: "Ha, Ha, Ha."

In class, as a writing-talking exercise, each child worked out scenes for a play. In these they discussed things we had taken up in class. We pooled these scenes and made a play. A copy follows:

Jack, The Stutterer

Scene I

The Playground

Bob: "Come and play football with us, Jack."
Jack: "I-I-I-I don't w-w-want to play."
Bob: "Oh, you are a stutterer, aren't you?"
Jack: "No, I'm n-n-not a s-stutterer."
Bob: "Well, it sounds like it. Anyway, we're sorry you won't play with us."
Philip: "We'll have to play without him, I guess. Come on."
Ronald: "Say Jack, you go to speech class, don't you?"
Jack: "Oh, yah. You want to fight. Somebody's s-s-stuffing you if they say I do."

(Jack walks off angry.)

Scene II

Speech Class

Miss Adams: "Boys, this is Jack, our new stutterer."
Everyone: "Hello, Jack."
Bob: "D-d-do you stutter much?"
Jack: "N-no, I-I-I-I don't."
Bob: "Oh, you haven't learned to admit and advertise your stutter, have you?"
Jack: "What do you mean by that?"
Bob: "That means you don't try to cover up your stutter, instead you tell people all about it and fake spasms if you don't have a real one."
Bill: "You don't get so excited and tense trying to cover up your defect because you tell about it, there's nothing to hide."
Bob: "Yes, and boy, you feel so much better and aren't half as afraid."
Ronald: "Besides you make other people more comfortable. They don't have to feel sorry for you any more."
Robert: "Yes, and they learn from you that all you need is to be given time to say what you have to say."
Bill: "I tell them please not to interrupt me, that it may take me quite a while to say what I want to say, but I'll get it out if they give me half a chance."
Robert: "Another thing, fellows won't tease you half as much when you are honest about your troubles."
Jack: "H-h-how do I begin that sort of th-thing?"
Robert: "You start advertising by telling your friends, teachers, and others that you are a stutterer."
Bill: "You show them the way you stutter by faking some of your spasms and you go out and see how many spasms you can collect and take a list of the words that cause you trouble."
Robert: "You do all the assignments your speech teacher gives you and try to think up some for yourself."
Jack: "Guess I'll try a little of that sort of thing and see if it makes me less worried and less afraid of my stuttering."
Miss Adams: "Your assignment for next time is to tell five different people about your stuttering and if you have no real spasms while speaking to them fake some. Make a list of the people you tell and what you say and bring it to class next time."

Scene III

Playground—A few weeks later

Bob: "Hi, Jack."
Jack: "Ha-ha-hello."
Bob: "Oh, I see you still stutter."
Jack: "Sh-sh-sh-sh-sh sure."
Ronald: "Come on and get in the football game."
Jack: "All right."
Bob: "Gee, you seem like a different kid."

Jack: "I-I-I f-f-feel like a different one, too, because I'm n-n-not afraid of m-my speech anymore."
Philip: "Believe me we like you better too."
Jack: "My new motto is, "Be a good, honest stutterer."

We reviewed what we knew of secondary reactions and learned that a good way to overcome a habit is to learn a new one. So we introduced a new speech pattern. Bob was given "bouncing" because it differed from his old pattern. He was shown how to bounce without effort in this fashion, varying the rhythm, "oah, oah-oah can yuh you oah-oah come tah-tah-tah-tah too may my ha-ha house tah-tah today?" He was to use this as a means of handling his spasms. Instead of allowing his old reactions to appear he was to substitute this type of thing. He did it very well.

As the term neared a close, each stutterer again wrote an analysis of himself, comparing his speech behavior and reacting to what they were when he started work. The following is Bob's contribution:

Myself

"Before I came to speech class I said that I didn't stutter very much. I was ashamed of it. I did all kinds of things to cover up my trouble. I used a lot of force when I talked. I didn't like to lose when we played games. Now since I have been going to speech class, I'm not ashamed of it anymore. I talk to people about it. I fake spasms and I bounce. It's still hard for me to be a good loser. I still stutter but I don't force so much."

The next phase of our work will be more spasm handling.

BOOK REVIEW

(Continued from page 356)

Mr. Stanley is very critical of many of the books on voice, as evidenced in his rather ironic caption of chapter eleven, "What the 'Authorities' Say." There is no doubt that much has been written that would have better been left unwritten. Yet certain men listed among his "horrible examples" have made a distinct contribution to the field of singing, and, while they may have been unscientific, they really knew what they were about.

I am quite sure that any teacher often deals with absolutely unscientific terms in making himself understood to students. And I believe he has the right to do that as long as it leads to a clear understanding. For scientific language often leads to confusion. Nor is this a plea for unscientific teaching. Is it not axiomatic furthermore that any man who so readily admits that he is a scientist is most unscientific in implying that his answers are the last word in the field and that all others are a matter for laughter and even contempt.

However, when all is said, the field of singing owes a debt to Stanley for stimulating us and making us think, which, in the opinion of the writer, is one of the most important functions of the educator.

Louis H. Diercks

A LETTER TO THE EDITOR

To the Editor—

As editor of the Journal, I wonder whether you want to take public notice of the recommendation recently made by Dr. James Sonnett Green to Lieutenant Colonel Lewis B. Hershey, Acting Director of the Draft Administration. He recommended to Lieutenant Colonel Hershey, according to the Associated Press, that stutterers be exempted from military service. I feel that the grain of justification in his recommendation should be leavened by consideration of the obvious fact that many stutterers are undoubtedly fully capable of military service. The King of England is a stutterer. The worst feature of Dr. Green's recommendation is that it implies that stutterers, generally, are incapable also of responsible work in civilian life. I feel that authoritative speech pathologists should counteract that implication to the extent that it should be counteracted on the basis of facts and ordinary fairness.

Sincerely,

Wendell Johnson,
Associate Professor of Psychology and Speech Pathology.

Editor's Note.—Nobody can speak with better authority than Dr. Johnson. He is not only a sound experimental scientist of repute in the field but can speak for the stutterers, being the author of the widely quoted "Because I Stutter."

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